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VETERINARY MEDICINE

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VETERINARY MEDICINE

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Animal feeds are more often deficient in methionine than any other amino acid. Few vegetable proteins contain it.

A substitute for egg white can be made from fish. It possesses the physical characteristics of albumen, is approximately 94% protein and highly nutritious.

Various paper mills are installing a process to make animal feed from the waste liquor from paper manufacturing. This new food is a sort of yeast, high in protein content.

Tests have shown that animals receiving inadequate protein in the ration do not develop as strong or as permanent immunity following vaccination as animals receiving an abundant protein ration. Clinical observation, early established this principle in the vaccination of swine for the prevention of hog cholera.

Either vitamin A or vitamin C deficiency may cause a dermatosis in cattle. The skin becomes harsh and scaly, thickened and wrinkled. The coat is thinned or entirely absent. The condition does not improve from use of the usual applications for dermatitis, but responds promptly when the deficient vitamin is added to the ration.

The increased use of mow-cured and dehydrated hay for cattle and increased feeding of grass silage, while it supplies the animals with a greater amount of vitamin A, deprives them of most of the vitamin D formerly obtained from sun-cured hay, and increases the need of lactating cows and particularly growing calves for vitamin D supplements.

Two hours after eating the contents of the stomach are usually sterile.

It has been shown experimentally that foot-and-mouth disease virus will survive for months in frozen carcasses.

Medicine is on the way to complete triumph over infection. It is freely predicted that within a few years chemical or antibiotic antagonists will be developed for all pathogenic organisms.

Modern methods of transportation have put all practitioners in the small animal field. Whether or not one does small animal practice depends more upon one's attitude than upon one's location.

The importation of poultry from the United States is forbidden by Canadian regulations except each bird be accompanied by a certificate signed by an official of the USDA stating that it is not affected with avian pneumoencephalitis.

Formerly a criterion of a good surgeon was speed, now it is gentleness in the manipulation of tissues. Because of better anesthetics and better methods of inducing and maintaining anesthesia, speed in operations has lost its value, but retained its disadvantages.

Many plants that formerly handled live poultry are being converted into poultry eviscerating plants. This and the new types of home freezer lockers are developing an awareness of poultry quality on the part of consumers. A logical next step is a preference for an inspected product.

Selecting Veterinary Students

A profession charged with matters of general concern is obligated to give watchful attention to its service of recruitment. Therein lies the level of the moral and material development it will be able to attain. According to the medical press of both Britain and the United States the medical profession is more perturbed in this respect than our own. All available criteria for passing judgment upon the matriculant at the time of admission in lieu of the scholastic method alone are pointed out as an obligation to the coming generation. Intellectual tests are taken for granted and to be kept at high levels, but to fill the ranks ex-

Adaptability and behavior in training should be considered in the selection of veterinary students

clusively with the literate giants of the secondary schools and colleges is open to improvement as a means to the desired end—a strong, irresistible front of do-or-die soldiers, which characterizes the spiritual development (= guts) of the self-made man. As things look today that spirit still lives and rules and should, therefore, be measured somehow in selecting veterinary students.

It must be admitted that the question is involved and a tough one to throw upon the lap of the colleges but the fact remains that it should not be ignored in the routine selection of the profession's future personnel. Moreover, thoughtful minds frankly admit that validating a student at the door of the college is a rather bold stroke at passing on unpredictables. Perhaps, the selection of medical and veterinary students on probation and weeding them out for their own good further along as is done, perforce, at Annapolis and West Point is the solution. The maturity that creeps upon a student as the course proceeds and his behavior in training ought to afford the better means of selection.

* * * *

A Note for Antivivisectionists

Recently there has been serious antivivisection agitation in several of our major cities. Animal experimentation has played such an important part in the development of surgical anesthesia, one of mankind's greatest boons, that it seems repetitious and carping to have to remind the public of its benefits. The entire history of anesthesia from its beginnings illustrates this truth: the accomplishments of Hickman, Morton, Corning, Waters, and countless others would have been virtually impossible without preliminary trial on animals. Perhaps antivivisectionists would have preferred a different ending to the following story, told by Lord Playfair at the Massachusetts General Hospital's commemoration of the semi-centennial of Morton's first demonstration. Sir James Young Simpson once told Lord Playfair that he was dissatisfied with chloroform and was interested in finding a substitute.

Lord Playfair a few days later announced to him that he had made the required discovery. The material that he intended to use was bi-bromide of ethylene. Sir James Simpson smelled the compound, and forthwith said that it was the very thing wanted. He was very anxious to repair immediately to Lord Playfair's private room and experiment upon himself.

Lord Playfair was unwilling that the experiment should take place before further trial, and finally induced Sir James to have the anesthetic tried on some rabbits first. The rabbits were accordingly treated, and were put away to await developments.

On the next day Doctor Simpson appeared at Lord Playfair's laboratory, propped himself up with two chairs, and asked Lord Playfair for the solution. Lady Simpson, who was present, advised her husband to see how the rabbits had fared under the treatment before he applied it to himself.

"When the attendant came in," continued Lord Playfair, "we saw him holding by the ears two rabbits—perfectly dead!"

Since anesthesia is only one of thousands of medical advances made possible by animal experimentation and, since continued medical progress depends upon such work, let us hope that human life will continue to be placed above that of the lower animals.—*Josiah C. Trent* in *J. of the History of Med.*, Oct., 1946.

BUY U. S. SAVINGS BONDS

In any 10-year period 1,500,000 persons in the United States develop peptic ulcers according to Dr. A. C. Ivy, vice-president of the Medical Schools of the University of Illinois.

I am convinced that of the millions of dollars spent by farmers each year for distinfectants, more than half is wasted. Worse than wasted in fact, for the time spent in putting on unnecessary disinfectants or the wrong type of disinfectant also is wasted.—*E. C. McCullough.*

The Ministry of Health (in Britain) has long been of the opinion that the freezing test is the best that has yet been devised for detecting the presence of added water in milk. It has the disadvantage, however, that in rare instances the milk of individual cows has an abnormal freezing point. The test is applicable only to fresh milk.—*Farmer and Stock Breeder* quoted in *Vet. Rec.*, 58:40.

Curare an Adjuvant to Anesthetics

General anesthesia, particularly inhalation and chloral hydrate anesthesia, normally progresses through four stages, excitement, analgesia, unconsciousness and relaxation. A fifth stage, complete paralysis, is induced in euthanasia and in those fatal accidents that sometimes, but rarely, terminate the progression.

The demarcation between the stages is not acute. In veterinary practice the first stage is commonly eliminated by administering preanesthetic narcotics. In human medicine the second stage is much used for minor surgery or in any operations that can be completed in a few seconds. Thus for incising an abscess the inhalation of chloroform for one minute is as efficacious as local anesthetic, and the patient remains as fully conscious as when the latter is employed. This stage of chloroform anesthesia was formerly much employed by physicians in handling normal parturition and many still use ether in this way. In veterinary medicine this second stage anesthesia has but limited application.

The principal hazard in general anesthesia begins in the stage of relaxation. This is so well recognized in veterinary practice that not a few carry the anesthesia no further and thus fail to obtain the relaxation of the tissues indispensable to good surgery.

Curare was formerly much used in veterinary medicine in the treatment of tetanus, azoturia, toxic encephalomyelitis and like excitable conditions but passed completely out of the veterinary armamentarium about a generation ago. Its use has been revived by the medical profession and it is now attracting considerable attention as a relaxant in convulsion and other states of great excitement. One purpose for which it is employed is to produce complete relaxation in surgical operations. This obviates the necessity for carrying the anesthesia beyond the stage of unconsciousness and avoids the dangers inherent in the fourth stage or rather the danger that it may slip into the fatal stage of complete paralysis.

Perhaps curare has a like useful role in animal anesthesia.

Proper Use of Penicillin*

It is stimulating to the clinical veterinarian to follow the continued brilliant developments in the field of science, which sustain and support all medical efforts. All recent developments serve to emphasize the importance of accurate differentiation of the species of infecting microorganisms *before* medication is employed. With the amazing therapeutic weapons developed during the past decade, the new biological and antibiotic medicinals and chemotherapy, veterinarians are better armed to combat the various animal disease than ever before.

Penicillin, developed during the war years, has an important place in veterinary medicine. However, as its use increases, a very real danger of the development of new bacterial enemies arises. There are increasing numbers of reports of resistant or fast strains of formerly susceptible organisms, such as streptococci, following treatment with small amounts of penicillin. The quality of penicillin resistance may be transmitted through successive generations of bacteria. An animal treated with inadequate dosage of the drug, or with a product of low activity can, conceivably, become a carrier of penicillin-resistant, virulent organisms which, under favorable circumstances, could start a new variety of epidemic.

In five years, since the beginning of the war, the penicillin industry in this country has grown from nothing into a $60,000,000.00 business. The cost of production has been astonishingly reduced, but it is still too expensive to use in some animals. The frequency of administration also is a handicap and not entirely practicable in the field of veterinary medicine. Some of the causes of failure from the use of penicillin are:

1. Inadequate dosage—fastness
2. Inadequate drainage
3. Overwhelming infections
4. Organisms are not effected by the drug
5. Treatment is too brief.—*H. C. Smith.*

*From a discussion at a meeting of the Florida Veterinary Medical Association, Oct. 28-29, 1946.

Legion of Merit

By direction of the President, the Legion of Merit for exceptionally meritorious conduct in the performance of outstanding services during December 1941 to November 1945 was awarded by the War Department to Colonel Frank C. Hershberger, Veterinary Corps, United States Army. This award supersedes the award of the Army Commendation Ribbon to Colonel Hershberger for services during the same period.

By Order of The Secretary of War:

DWIGHT D. EISENHOWER
Chief of Staff

Texas Supplied Many Reserve Officers

Between 1919 and our entry into World War II the Nation-wide R.O.T.C. system produced 112,000 Reserve officers of whom 58,000 were still on the rolls in 1941. In all, more than 200,000 Reserve officers served on active duty in World War II, and the R.O.T.C. was their greatest single source. Reserve officers from Texas A. & M. served on many fronts in our successful struggle against Germany and Japan. The R.O.T.C. of this one institution furnished the Army 7,000 officers—far more than any other college. (Excerpt from address by General of the Army Dwight D. Eisenhower, at the Texas A. & M. sunrise Easter service, College Station, Tex., 21 April 1946).—*Bul. U. S. Army Med. Dept.*, 6:3, p. 238.

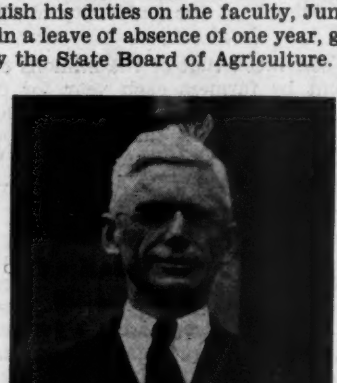
Colonel Dildine Retires from Army Service

Col. Seth C. Dildine, V.C., 55, retired Dec. 31, 1946. Colonel Dildine accepted a commission as second lieutenant in the Veterinary Corps of the Army, immediately after graduation from the Ohio State University in 1917 and was promoted through the grades attaining the permanent rank of colonel in 1944. He was graduated from the Army Veterinary School, the Chemical Warfare School, and the Medical Field Service School, advanced course. His military service included many stations among them a tour in the Surgeon General's Office, one in China and one in the Philippines. During World War II he was stationed at the Market Center, Chicago. It is estimated that the value of the products for the inspection of which he was responsible during this assignment exceeded three billion dollars.

Colonel Dildine was awarded the Legion of Merit in September, 1945, and received letters of commendation from the Quartermaster General and from the Surgeon General on his retirement.

Dean Giltner to Retire

Dean Ward Giltner of the School of Veterinary Medicine, Michigan State College, will relinquish his duties on the faculty, June 30th, to begin a leave of absence of one year, granted him by the State Board of Agriculture. At the



Ward Giltner

expiration of his leave, June 30, 1948, he will retire.

Dean Giltner has been on the faculty of M.S.C. since 1908. Since 1912 he has been Professor of Bacteriology and since 1923 Dean of the veterinary school. Prior to going to the Michigan institution he was assistant in veterinary medicine (1906-08) at the Alabama Polytechnic Institute at Auburn.

Dean Giltner was born at Ithaca, N. Y., in 1882 and was graduated from the New York State Veterinary College in 1906. He received the M.S. degree from the Alabama Polytechnic Institute in 1908 and Dr. P.H. from the University of Michigan in 1933.

General Jean Fray, head of the veterinary service of the French Army in World War I, died Jan. 23, 1945, at the age of 85. General Fray was the first to establish a centralized veterinary service for the armies of any nation. The centralized military veterinary service of Great Britain was largely modeled after that of the French as was our own later.

General Fray also developed the civilian veterinary service of Algeria and Tunisia. He held that to supply a veterinary service to primitive people was one of the first measures to be taken in colonization. Great Britain is now following to the letter this plan originated by General Fray.[1,2]

[1] Veterinary service improves native cattle on the African Gold Coast. *Vet. Med.*, 42:1, pp. 10-12. 1947.
[2] Simmons, R. J., Veterinary science works modern miracle in Uganda. *Vet. Med.*, 39.9 pp. 336-338.

International Animal Production Congress

The first International Congress on the Physio-Pathology of Animal Reproduction and Artificial Insemination will be held in Milan, Italy, April 9-15, 1947.

The scientific program of the Congress is divided into the following sections: (1) General Biology, (2) Applied Genetics, (3) Morphology and Physiology of Reproduction, (4) Pathology of Reproduction, (5) Artificial Insemination, (6) Breeding and Feeding of Breeding Animals and (7) Economic, Organizational and Legislative Problems.

The main objects of the Congress are of the greatest concern to all countries of the world on account of the importance of the studies of modern genetics and reproductive biology and the necessity for increasing the quantity and improving the quality of animal production.

Professor Telesforo Bonadonna, Director, Instituto L. Spallanzani, Via Bronzetti, Milano, Italy, is general secretary of the Congress.

Birth Weight of Beef Calves Related to Future Growth

The weight of a newborn beef calf is a clue to the rate at which it is likely to grow, the USDA has found. And because a calf's weight is one of the first measures of its development, Department livestock scientists have studied its possible value in stock raising.

Their findings are based on 402 beef Shorthorn calves born as singles over a period of 14 years. The calves were from 112 cows bred to 28 different bulls. Average weight of the calves at birth was 70.5 pounds but the range in weight was from 40 to 109 pounds. Calves that were heavier than the average tended to reach a weaning weight of 500 pounds sooner than calves that were lighter at birth. Among 72 steer calves fed to a slaughter weight of 900 pounds, those that were heaviest at birth and at weaning time generally reached slaughter weight the soonest.

The data indicated, also, that birth weight of calves is influenced by heredity. Some bulls consistently sired calves having birth weights heavier than the average; other bulls sired relatively light-weight calves. Individual cows also had a considerable maternal influence on birth weight as well as on the subsequent development of the calf. The investigation disclosed likewise that the birth weight of calves tends to increase with the age of the dams until they become six years old. After that there is no further increase.

The data failed to show any relationship between birth weight of calves and their economy of gain in the feedlot. The general results of the study indicated the desirability of giving the birth weight of calves some consideration both in the selection of breeding stock and in choosing animals to be fed for slaughter.

Fifty years ago swine had to be fed for a year to get them into market condition, and it required 22 bushels of corn per hog. Today half that amount of corn plus 100 pounds of supplement will do the same job in six months.

A Reuter's dispatch notes that semen packed in icefilled flasks was flown from a stud farm in Pennsylvania for insemination of 100 Jerseys in Australia. The six-day flight was *via* Great Britain.

Hoven (Tympanites) an Allergy

It was noted that some animals after receiving the first sensitizing dose of trichomonal antigen reacted markedly to a second dose given seven to ten days later or at longer intervals. General constitutional symptoms of the anaphylactic type developed. Amongst these a notable symptom was the accumulation of gas in the rumen which became markedly inflated with all the symptoms of hoven or bloat. This condition could be relieved effectively by the subcutaneous injection of adrenalin. The symptoms of hoven appeared within 30 to 60 minutes after the second or exciting dose. It struck both Kerr and myself that possibly certain types of bloat which occur in animals very suddenly after ingestion of clovers, green corn, etc., are really a form of anaphylactic shock. It appears that certain products, such as histamine, are formed as a result of the interaction of the antigen. These products produce spasm of unstriped muscle as, for example, in asthma, which condition can be relieved by the subcutaneous inpection of adrenalin. Healthy cattle eructate with great frequency. If this eructation is prevented by closure of the esophagus bloat results. Where feeds are ingested which are liable to produce increased gas formation in the rumen and also spasm and closure of the esophageal opening, very marked distension of the rumen results. In all these cases we suggest that, in addition to relieving the bloat with trocar, and cannula where this is urgently necessary, a subcutaneous injection of adrenalin should also be given and, if necessary, repeated in 20 minutes. We have met many cases of bloat in cattle which gave a prompt response to the injection of adrenalin and recovered without further treatment.—H. G. Lamont, M.R.C.V.S., in the *Vet. Rec.*, 58:47, pp. 520-522. 1946.

Use of Strain 19 Brucellosis Vaccine in Britain[1]

At one time it was considered good practice to control brucellosis in a herd by the use of the agglutination test and the elimination of reactors, but it soon became evident that infection could be so easily introduced into a clean herd that some other method was preferable in the conditions prevailing in Great Britain. It was almost invariably found that when a clean herd became re-infected the disease spread rapidly within it and very heavy

John N. Ritchie, M. R. C. V. S.
In 1944 Doctor Ritchie visited the United States for a study of our federal meat inspection and animal disease control. While here he visited many of the meat packing plants, state experiment stations, various laboratories and most of the veterinary colleges

losses occurred. The vaccine known as the American Strain 19 vaccine was therefore used experimentally and eventually recommended for use under the Control Scheme, and vaccination was adopted as the main policy of control of this disease in cattle. The Calf Vaccination Scheme was later introduced in December, 1944. Under this scheme, heifers from six months of age up to the time of the first period of estrus are vaccinated. All attested herds and all registered dairy herds are eligible. Vaccination is normally done at the time of a routine visit either for a tuberculin test or for inspection of the herd and this enables the work to be done at the low cost and a great saving in man-power. In the first year of its operation over 200,000 calves were vaccinated and 57,105 dairy herds participated in the scheme.

In the first six months of 1946 360,941 doses of Strain 19 vaccine were used.

Since 1942, 50 vaccinated herds have been under close observation by members of the veterinary staff at Weybridge and in addition visits have been made to inquire into any complaints which have been received in connection with vaccination.

Complaints which have been investigated may be listed under certain headings.

1. *Abscess formation and persistent local reactions in 25 herds.*—These cases occurred in the earlier days of vaccination and improvements in technic have completely eliminated these conditions.

2. *Systemic disturbances and fall in milk yield in 18 herds.*—These certainly do occur; milk yield may fall as much as 80 pounds per cow, but the average loss is about 24 pounds spread over nine days.

3. *Fatalities—eight animals.*—The cause of death was shown to be unrelated to the vaccine in every case.

4. *Infertility and sterility in vaccinated animals—in 44 herds.*—In no case could evidence be found to show that the vaccine was responsible. The cause varied from infertility in the bull to infection of the female genital tract and anestrus which occurred equally among vaccinated and non-vaccinated animals.

5. *Abortions occurring in vaccinated animals—in 144 herds.*—Only in six herds was it shown that an insufficient degree of immunity had been produced by the vaccine. In other cases 76 animals were infected when vaccinated, in 33 an "abortion storm" was in progress when vaccination was done, in 29 abortion was due to causes other than contagious abortion such as trichomoniasis.

* * * *

Strain 19 Brucella Vaccination

In 1942 the introduction by the Ministry of Agriculture [Britain] of this form of vaccination against contagious abortion marked a great advance in the control of the disease. The advantage claimed for this strain of *Brucella abortus* culture is that vaccinated animals cannot spread the disease—this is very different from the live cultures employed prior to this date; again there is no risk of the vaccinated animals excreting virulent organisms in their milk and endangering human life.

The routine use of this form of vaccination is common knowledge to all veterinarians. It is recommended that heifers from six months onward be vaccinated. They may be mated the day after vaccination or at any subsequent time.

Such vaccinated heifers after they have had their calves should be vaccinated again, and this vaccination is usually adequate for the remainder of their lives.—T. Norman Gold, M.R.C.V.S., in *Vet. Rec.*

[1] Richie, J. N., M.R.C.V.S., Deputy Chief Veterinary Officer [British] Ministry of Agriculture and Fisheries. Wartime achievements of the British Home Veterinary Services. Presented at the 64th Annual Congress of the National Veterinary Medical Association of Great Britain and Ireland, London, Sept. 26, 1946. *Vet. Rec.*, 58:50, pp. 585-589. 1946.

Beginning in 1943 a long range experiment was undertaken at the Purina Research Farm to determine if there be any foundation in fact for the widely held belief that goats do best when supplied with browse. The results of the experiment show that the production of milk goats is not increased by browse when they are on good pasture or have an adequate ration of grain and alfalfa hay.

A. M. A. Council Urges Public to Demand Pasteurized Milk

An editorial in the January 25 issue of *The Journal of the American Medical Association* states that "the value of pasteurization of milk in preventing the spread of milk-borne disease is now well established." Continuing, the editorial says:

The Council on Foods and Nutrition of the American Medical Association in an official statement says, in part, "The pasteurization of milk is a public health measure. The public should demand pasteurized milk for drinking and the use of pasteurized milk in milk products. The dairy trade should universally adopt pasteurization in the interest of public health." Only pasteurized milk is granted recognition by the council.

Meat Importations and F. & M. Disease

Great Britain suffered an increased number of outbreaks of foot-and-mouth disease during the war. These outbreaks were connected with the meat imported from South America. Summing up their experience Sir Daniel Cabot, Chief Veterinary Officer, Ministry of Agriculture and Fisheries, said in 1945:

"The association of disease with the imported meat trade either directly on butchers' premises or indirectly by the taking of swill in the raw state to piggeries, indicates without any question the source of infection during the past year.

"The only countries infected with foot-and-mouth disease from which any meat was imported into Great Britain during the period under review were the South American republics, and there seems no room for doubt that it was from these countries that our repeated infections were derived."

Referring to the war experiences with foot-and-mouth disease in Britain, Mr. J. N. Ritchie, M.R.C.V.S., said in 1946:

"Large quantities of foreign meat have been imported, and most of our initial outbreaks of foot-and-mouth disease have been among pigs and, generally speaking, among pigs fed on swill. In no case has it been recorded that pigs developed the disease when fed on swill coming from American camps where North American meat provided the ration for the troops, whereas many outbreaks arose in pigs fed on swill originating in camps where imported South American meat was used. It has been quite definitely established that South American meat and pork are the source of infection."

In the summer of 1946 Britain concluded a trade agreement with Argentina providing for the purchase of some 80% of Argentina's surplus beef. Perhaps that explains why an Associated Press dispatch from London Jan. 26 tells of the slaughter of 4000 animals in the past five weeks on account of outbreaks of foot-and-mouth disease.

Montana Salubrious for Animals

The report of the State Veterinary Surgeon of Montana for 1946, indicates that, so far as disease is concerned, Montana is just about the safest spot in the country, in which to own animals.

There was no glanders, no dourine, no periodic ophthalmia. Only 18 horses died of encephalomyelitis and there was much less infectious anemia than formerly; in fact only two or three districts in which the disease occurred at all.

Cattle

There were no cases of anthrax nor of leptospirosis; only one case of Johne's disease, two of malignant catarrh and six of anaplasmosis. There was only one outbreak of scabies and that in a very small herd.

More than 25 thousand cattle were given the tuberculin test and but four reacted. No tuberculous animals were found on post-mortem inspection at any of the abattoirs within the state.

Tests of 46,865 animals for brucellosis revealed 1940 reactors and 2100 suspects—nearly 10%.

Black disease (*Clostridium novyi* infection), pulmonary emphysema (probably an allergy) and pododermatitis (foul foot) increased somewhat over the incidence in 1945, Thirty-five cases of bacillary icterohemoglobinuria were diagnosed.

Approximately 800,000 cattle were shipped out of the state or slaughtered at abattoirs within the state during 1946. It was the most prosperous year for cattle raisers in the history of the state.

Sheep

There was no scabies; foot rot in but one band, lip and leg ulceration in one band, contagious ecthyma in five bands, enterotoxemia in five bands, five cases of blackleg, 80 cases of vibrionic abortion and a greatly decreased loss from intestinal parasites.

Swine

Hog cholera occurred on but four premises. There were 150 cases of swine erysipelas.

Dogs

No rabies has occurred in Montana since 1925.

In the course of an experiment on an island off the coast of Scotland a group of British and American veterinarians developed a strain of anthrax three times as virulent as any strain known previously.

Sterne tested four commercial anthrax bacterins manufactured by "reputable American firms" at the Onderstepoort laboratories of the veterinary service of the Union of South Africa and he reported was "unable to elicit any substantial immunity against anthrax."

The establishment of a Canine Disease Research Center probably in the south of England is contemplated by the Veterinary Educational Trust of Great Britain. At present an Equine Disease Research Center is being organized at New Market, England.

The Ceylon Veterinary Association has, since its inception, urged upon the authorities the compulsory vaccination of dogs for the prevention of rabies. In the absence of such a law the Association has conducted a public education campaign to induce dog owners to have their animals vaccinated.

Strongylosis as an Unsoundness

In a discussion of examination of the horse for soundness, I was surprised to note no mention of strongylosis as an unsoundness of the horse. To my mind it is quite on a par with such phenomena as strained tendons, and I should not dream of giving any horse showing clinical symptoms of infection with strongyles (e.g., injected membranes, a harsh staring coat) a sound certificate without a microscopical examination of the feces.—*Paul Crosfield* in *Vet. Rec.*

Greater Recognition Sought by the Poultry Industry

At present, under the reorganization of the Department of Agriculture by Secretary Anderson, the poultry industry is represented by a section or separate branch in the Production and Marketing Administration.

It is contended by Hanke in the *Poultry Tribune* that, since in 1945 the gross farm income from dairy products was $3,632 million and that the dairy industry is represented by a division, the poultry industry, which grossed $3,049 million in the same year, should have division status.

It is thought that having a division status it would be possible to have a broader research program and that more federal funds would be available for such research.

Dr. Clifford Westerfield has resigned his position at the University of Kentucky to become head of the Veterinary Department of the University of Georgia, Athens, where a veterinary college is being established.

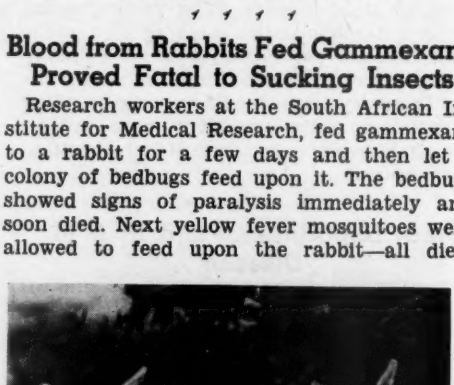
Antibiotic Treatment for Ringworm

The latest in antibiotic therapeutic agents is tomatin, made from the juice of the Panamerican tomato vine. It is reported to be destructive to Tricophyton and to various pathogenic fungi. It is not yet available commercially.

As reported in the October *Journal of Dairy Science*, G. N. Salisbury of Cornell University finds that with 5,765 inseminations there was no difference in fertility between semen diluted one to 40 compared with a dilution of one to 100 parts of egg yolk citrate diluent.

Blood from Rabbits Fed Gammexane Proved Fatal to Sucking Insects

Research workers at the South African Institute for Medical Research, fed gammexane to a rabbit for a few days and then let a colony of bedbugs feed upon it. The bedbugs showed signs of paralysis immediately and soon died. Next yellow fever mosquitoes were allowed to feed upon the rabbit—all died.



Bedbugs fed on the rabbits soon died

Finally a number of ticks were placed on the rabbit. They did not feed fully but showed obvious signs of distress which persisted for several days. However, in 10 days all the ticks were dead. The rabbit was unharmed, but the experimenters did not learn whether feeding gammexane continuously over a prolonged period will harm domestic animals. If it will not they express the opinion that this method may be of great value in ridding areas of insect pests that do not frequent buildings or for other reasons cannot be reached with sprays or by dipping.

14 Points for Pullorum Disease Control

The Poultry Disease Control Laboratory of the Massachusetts Agricultural Experiment Station announces (Bulletin 128) the following principles as being essential to the successful control of pullorum disease:

1. All the birds on the premises should be tested each year.

2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.

3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.

4. Offal from the birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.

5. The poultry houses, runs, and equipment, should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.

6. Birds removed from the premises to egg-laying contests, exhibition, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.

7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks.

8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.

10. Poultrymen should not custom hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

* * * *

The Illinois Agricultural Experiment Station has a flock of Leghorns that are immune to fowl pox. Not even when the mucous membrane of the mouth is scarified and swabbed with live virus can these chickens be infected.

* * * *

According to a report from the State College of Washington, feeding a mash containing 0.3% of sulfamerazine to chicks and poults one week old 24 hours after they had beeen infected with paratyphoid, reduced the losses from the disease. However, greater benefit was derived when 0.5% of sulfamerazine was added to the mash.

* * * *

In 1934 about 47% of all the chickens raised in this country were incubated in commercial hatcheries; in 1945 93% were so hatched. Hatchery supply flocks in the National Poultry Improvement Plan contained nearly 18 million hens, of which 30% were Leghorns, 23% New Hampshires and 8% were Rhode Island Reds.

* * * *

Salt for Turkey Poults

According to Storrs Agricultural Experiment Station turkey poults can be given 2% of salt in their ration safely if the ration is relatively salt-free. However, the Texas Agricultural Experiment Station suggest that only 1% of salt be included in the young poults ration since there may be salt already supplied in the water or the ration.

* * * *

The New York Legislature has appropriated $50,000 for research on ducks and turkeys, The duck industry in Suffolk County, Long Island, is being studied through this appropriation. This county supplies 95% of the ducks of the state and 45% of those produced in the United States. Studies of disease control in turkeys are being made by the New York State Veterinary College at Ithaca; for ducks at the branch station at Farmingdale.

* * * *

In experiments conducted by the Kentucky Experiment Station, a new protein feed was found in tobacco seed meal, and oil obtained from the tobacco seed proved to be highly digestible and nutritious. Neither of these products contained nicotine.

In tests rats grew well on a ration of 15% protein, all from tobacco seed meal, when the ration was supplemented with the amino acid lysine which is supplied from dry milk solids.

Civil Service Examination for Veterinarians

An examination has been announced by the U. S. Civil Service Commission for filling veterinary positions in Washington, D. C., and throughout the United States, principally in the midwestern section of the country. The majority of vacancies exist in the Bureau of Animal Industry of the U. S. Department of Agriculture.

The salaries range from $2,644 to $4,149 a year. No written test is required. To qualify, applicants must have completed a full course of study in veterinary medicine in a college or university of recognized standing. In addition, applicants for the higher grades must have had experience in professional veterinary work. Graduate study may be substituted for one year of this required professional experience. Applications for the lowest salary level will be accepted from students who expect to complete the required courses not later than June 30, 1947. The age limits, 18 to 62, are waived for persons entitled to veteran preference.

Information and application forms may be obtained from most first- and second-class post offices, from Civil Service regional offices, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications must be received in the Commission not later than March 11, 1947.

Make Your Working Surfaces Acid, Alkali, and Water Proof

Keeping the working surfaces in a first class sanitary condition can be a pleasure in any veterinary hospital, whether new or old, if all surfaces, that are exposed to hard usage, are properly finished with surface coatings impervious to acids, alkalis, and water. Such a finish has other advantages, too. It is easy to obtain as anyone working with simple materials and simple equipment can do the work. Old tables or old furniture on hand can be used to good advantage if new things are unavailable. And such surfaces, aside from being acid, alkali and water proof, are also unaffected by humidity, heat and cold, as so many painted, varnished, or enamelled surfaces are.

This treatment can be used on any wood surface including floors, furniture, cabinets, cabinet tops, cabinet shelves, tables, and table tops. It gives an ebony black color which in time takes on a dull gloss very pleasing in appearance.

If the surface to be treated is new wood begin at once with the applications, but if it is old wood and has been previously painted, varnished, or oiled in the usual way these coatings must be removed down to the bare wood.

The removal of old paint and varnish is not at all difficult if a good commercial remover is used following the directions given on the can. A weak lye solution may be painted over the old finish and left a few minutes to soften the paint. Then this can be washed off using the water hose and when the wood is dry it can be sanded smooth ready for proofing. The removal of old finishes should be done out of doors if at all possible and in using any remover great caution must be exercised to avoid burning the hands and face by the fumes or by spattering the liquids on the skin.

Once the article to be treated is ready proceed as follows: Have ready two solutions, No. 1 and No. 2. Apply solution No. 1 with a brush while still hot and allow to dry. Then apply a second coat of the same solution. Allow to dry then apply a coat of solution No. 2 and allow it to dry thoroughly. Apply a thin coat of raw linseed oil with a cloth and rub all surfaces dry. The ebony dark color may not show up at once but will do so in time.

Solution No. 1

Copper sulphate	1 measure
Potassium chlorate	1 measure
Water	8 measures

Boil until the salts are dissolved and apply while still hot.

Solution No. 2

Aniline	6 measures
Hydrochloric acid	9 measures
Water	50 measures

The surfaces thus treated are now ready for use. Strong acids or alkalis will have little or no effect on them if wiped off soon after spilling. After a course of dirty work table tops can be cleaned with plain water or with soap and water. From time to time after cleaning with soap and water a thin coat of raw linseed oil should be applied. The oil may be diluted with turpentine if desired.

A finish of this kind has many advantages other than those that have been mentioned. It will not become sticky in hot damp weather. It does not chip or peel or crack. It can be cleaned readily with a minimum of effort. Time and wear tend to improve the appearance of the finish. Wood cabinet tops and table tops are cheaper in cost than porcelain or metal or tile and the soft quality of the wood is less destructive to metal instruments and glassware.—*L. R. Palmer.*

If You Must Sell Those Series E War Bonds . . .

By HAROLD J. ASHE
Los Angeles, Calif.

MANY who, prior to and during the war, purchased "Series E" War Bonds, are now considering cashing in part and continuing to hold some of the bonds. Before doing so, they should weigh carefully the interest implications of such a step. The choice of which bonds to sell and which to retain, may determine their gain—interest-wise.

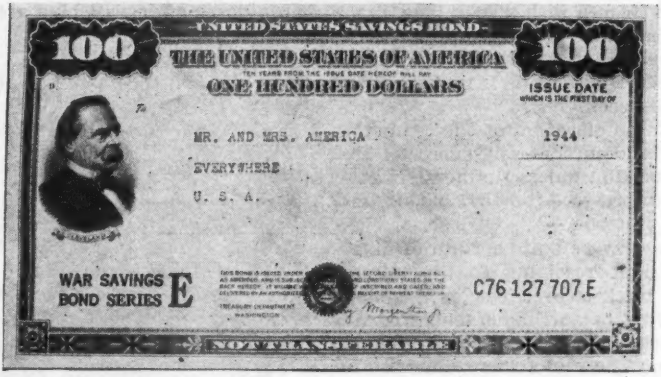
While it is true that, if held to maturity, these war bonds pay simple interest of 3⅓% a year, the return popularized in the war bond drives, the actual rate at maturity represents a return of 2.9% compounded semi-annually.

However, if cashed prior to maturity, it does not follow that the redemption rate at any particular time will result in an interest return of 2.9% for each year the bonds are held. To encourage the holding of bonds, the interest rate is graduated upward over the ten-year period from zero interest for the first year, up to more than 4½% in the final years, instead of having a fixed rate of interest throughout the ten-year period.

Thus, if the bond holder anticipates selling most or all of his bonds before maturity and, as in most instances, their date of purchase has been spread over several years, he will find that if he is not careful he will start cashing the oldest bonds that are just beginning to bear a fair rate of interest. Continuing this process as newer bonds in turn arrive at a point where they are starting to bear remunerative interest, he will prevent any of his bond holdings from ever bearing interest—or at best just the lowest bracket of interest.

Where the bond holder expects to gradually cash in his holdings prior to maturity, he should start with the newest bonds first, reserving the oldest bonds until the last. Thus he will receive the maximum interest return from his combined holdings.

Herewith is a table of interest rates for "Series E" War Bonds, based on compound interest semi-annually, which illustrates the point:



	Redemption Value	% Semi-Annual Compound Interest
1st Half Year	$18.75	0.0
½ to 1 year	18.75	0.0
1 to 1½ years	18.87	.63
1½ to 2 years	19.00	.68
2 to 2½ years	19.12	.63
2½ to 3 years	19.25	.68
3 to 3½ years	19.50	1.29
3½ to 4 years	19.75	1.28
4 to 4½ years	20.00	1.27
4½ to 5 years	20.25	1.25
5 to 5½ years	20.50	1.23
5½ to 6 years	20.75	1.21
6 to 6½ years	21.00	1.20
6½ to 7 years	21.50	2.38
7 to 7½ years	22.00	2.32
7½ to 8 years	22.50	2.27
8 to 8½ years	23.00	2.22
8½ to 9 years	23.50	2.17
9 to 9½ years	24.00	2.12
9½ to 10 years	24.50	2.08
At Maturity	25.00	2.04

Prevalent Diseases of Race Horses in Egypt

Conclusion of 1927-1947 Observations

By PROF. ZAKI MORCOS, F.R.C.V.S., M.V.Sc., D.V.H. (England)

Cairo Veterinary College, Cairo, Egypt

1. Piroplasmoses

THESE are the commonest infections of race horses in Egypt and although the majority of horses more or less resist them, yet when fatigued, some show acute symptoms, namely intermittent rise of temperature, and deep yellow mucous membrane of the eyes, lips and gums, as well as, in some cases, hemoglobinuria. One often fails to demonstrate the presence of both varieties of protozoa in the one film but if the *Piroplasma caballi* is seen and the horse is treated with trypan blue, then the *Nutallia equi* will make its appearance microscopically and vice-versa, if arsenic is first applied when the Nutallia is spotted, then *P. caballi* will be seen.

When there is no elevation of the temperature, it is very seldom that any sporozoa are seen in the blood film unless the horse is galloped for an hour or two. After that blood films may show the protozoa.

Clinically one may be quite certain of diagnosis even without resorting to the microscope, a dirty brick-colored eye or a yellow eye often showing hemorrhagic spots and an animal that does not feed well are indications of piroplasmosis. There is an irregular rise in temperature, the appetite depraved, and the animal is out of form and out of sorts.

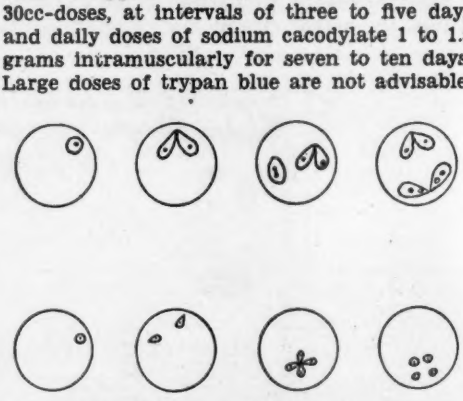
It is difficult to diagnose clinically a chronic infection of *Nutallia equi* as there may be nothing but an occasional rise of temperature.

As previously mentioned, race horses in Egypt resist Piroplasma and Nutallia wonderfully and when an animal shows symptoms, certain trainers just give a diuretic and a laxative with soft food, boiled mash and *barseem* when the horses apparently improve so much that a senior colleague of mine once said, "I do not believe that Piroplasma exists in Egypt" and unless typical pear-shaped forms of Babesia (Piroplasma) were demonstrated he would not consider the case as infected. Chronic forms of Nutallia show dot-like forms inside red cells—anaplasmoid forms.

Treatment.—No complete cure is of record. Horses treated and apparently recovered show symptoms after six months or longer of continuous hard training.

Certain chemicals appear to affect the protozoa but they destroy some of the tissue cells also, sometimes resulting in nephritis, hepatitis, etc.

The safest and best treatment is a combination of trypan blue 1% intravenously, three 30cc-doses, at intervals of three to five days and daily doses of sodium cacodylate 1 to 1.5 grams intramuscularly for seven to ten days. Large doses of trypan blue are not advisable.



PIRPLASMAS[1]—division by budding
Above, *Babesia bigemina*. Below, *Babesia equi*

Some horses do not tolerate it well. Trypan blue sterilized at 100° C. for 15 minutes is safe but when sterilized at 120° C. for 15 minutes, toxic symptoms usually appear after injection.

2. Rheumatic Arthritis

This ailment takes either an acute or subacute form.

The onset of the acute form is sudden. The animal is given its evening feed as usual and the next morning may have a temperature of 40° C. or even higher; be unwilling to move; have an arched back, and the four feet drawn together under the abdomen. If forced to move, he may be able to do so only very slowly, while showing signs of intense pain. The hoofs do not feel hot but slightly hot and all joints are very painful to the touch.

[1] The Internal Parasites of Domestic Animals, *Cameron*. Courtesy The MacMillan Company, New York.

The subacute form sets in gradually, with no rise of temperature. The animal is stiff and walks and trots with short strides, on going out of the stable, but after a few minutes trotting he regains almost the normal stride.

Treatment.—In the acute form large doses of sodium salicylate, three or four drams, together with sodium bicarbonate one to two drams in an electuary every four hours together with camphor salicylate injections, 10cc, twice a day. The temperature and movement will become normal in two to five days after which the ailment is treated as subacute. The subacute form, in most cases, disappears on intravenous injections of 1% trypan blue (20 to 30cc) daily for five days and in addition 2cc to 3cc of 48-hour broth culture filtrate of streptococci, diplococci and staphylococci isolated from cases of arthritis. The filtrate is given intramuscularly once every three days; five to seven doses being ample. The dose is increased gradually until a 5cc injection is reached.

Horses that eat their bedding are more predisposed than others and attacks appear more frequently in winter than in spring and summer.

3. Ringworm

This is the commonest skin trouble among race horses. It spreads rapidly in a stable taking either the form of denuded areas of small diameter, 0.5 to 1.5cm, or these may coalesce to form fairly large patches, anywhere on the body but mainly on the trunk, between the fore-legs, and on the neck. Scrapings of the border between the infected and the healthy skin and placing, with a drop of Loeffler's methylene blue, under a cover glass will reveal the fungus.

Ring worm control in large groups of horses is practicable only by dipping

Treatment.—For the small isolated patches painting with tincture iodine twice a day with a brush, but not with cotton wool will stop the trouble in few days. When large areas are met with, to counteract the damage of skin by secondary infection with saprophytic bacteria, an ointment made up of equal parts of sulfur, iodine and B. P. zinc ointment, is employed. It aids in the healing process.

Advanced cases improve tremendously when, in addition to local treatment, arsenic in the form of sodium cacodylate is injected daily or on alternate days for seven to ten days, in one gram doses.

Disinfection of the saddle blanket, body cloth, brushes, etc., is essential. Soaking these articles in a 1:5000 formalin solution for few hours is a good procedure.

One of the sources of ringworm infection is the labelled cloth of racing clubs, if it is not carefully disinfected after each meeting.

4. Anthrax

This serious infection is fairly common and is mostly intestinal. Pulmonary forms are met with, but they are few in comparison to intestinal forms.

Most cases are diagnosed as colic since *B. anthracis* is, in most cases, absent from the peripheral blood. The attack is of more or less sudden appearance, the temperature is elevated, but not excessively so, usually about 39° C., rarely 40° C. There is severe spasmodic and continuous colic and purging. The feces are very offensive, the urine is greenish in color and not tinged with blood. The mucous membranes of the gums and eyes are deeply congested and almost bleeding.

In the pulmonary form of anthrax there is profuse salivation, nasal discharge, loud snoring, extended neck and greatly labored breathing.

The course takes two or three days and, if promptly treated with large doses of potent anthrax antiserum, 50-100cc intramuscularly, and repeated after a few hours or the next day if needed, in most cases the animal recovers.

After death, the blood is dark and does not coagulate well and in the majority of cases the blood does not show *B. anthracis*, microscopically and even culturally or by guinea-pig inoculation.

5. Laminitis

This ailment is not uncommon and unless attended promptly, chronic inflammation of sensitive laminae or a dropped sole ensues.

Bleeding from the jugular is an old but successful means of relief, at least a litre of blood must be drawn. Large doses of salicylates, benzoates and urotropine, in electuary form, are indicated. Keep the animal well covered

Typical attitude of the second day of an attack of laminitis

and give a large dose of saline purgative.

Salines, sodium sulfate and sodium citrate in large doses should be incorporated in the drinking water. Five to six liters of soapy warm water as an enema introduced by gravity and a green laxative diet, are very helpful.

6. Strangles

This is a very common disease among race horses especially of horses between three and five years of age. The symptoms include a rise of temperature, swollen submaxillary glands and nasal discharge which in rare cases is obstinate and continues for a long period. Occasionally the parotid region also is implicated in the local inflammation.

Cases attended early recover in a few days, the swollen glands becoming normal. Large dose of streptococcus antiserum, 50-100cc intramuscularly and repeated doses of 20-30cc of prontosil also intramuscularly constitute an excellent treatment that has never failed me. This is best followed by streptococcus vaccine, one or more doses at five to seven day intervals.

Out of about 40 cases I attended, two horses developed a second attack of strangles after five months.

Lately 60,000 units of penicillin intramuscularly three times daily for three days were found curative. Dagenan (sulfapyridine), cibasol (sulfadiazine) in 10 tablet doses every four hours for three to five days is also satisfactory.

7. Tetanus

Tetanus is rare among race horses, owing to the practice of injecting tetanus antiserum in all cuts or abrasions or wounds. I have seen only one case, a black country bred horse that developed tetanus following extensive point firing and blistering of the flexor tendons of both forelegs by another veterinarian. I was called at 10 p.m. The animal was tied to a wall; the membrana nictitans was showing; the neck, back and limbs were stiff and hard to the touch. On releasing the horse, he could not move.

Tetanus antiserum, 50cc, was given intravenously once a day for three days. The animal recovered.

8. Tuberculosis

Three cases were not doing well, they fatigued easily and lost considerable flesh. Calcium, vitamins, arsenic, strychnine and testicular preparations all failed to improve their condition. The teeth and alimentary canal were not neglected. *These animals were tuberculin tested with negative result.*

It appears that tuberculosis is almost unknown among horses in Egypt. I have seen only one case since 1929 and that was in a mule in the dissecting room at the Cairo Veterinary School. The bronchial lymph glands were about 15 to 20 times the normal size, fibrous in texture, spleen and other organs were more or less normal.

Scrapings from the enlarged glands and sections revealed broken down, dot like acid fast bodies.

Confirmative diagnosis by guinea-pig inoculation was impossible due to the animal being injected with formalin preparation for dissection.

9. Infections Following Castration

When animals are released two or three days after the operation to lie down, cocci infection is liable to occur. Hence, it is advisable to administer pyogenic antiserum before the operation. It is also advisable to give the animal a dose of tetanus antiserum at the time.

One animal developed malignant edema, six days after the operation, all the body under the skin was raised and pitted on pressure. The temperature was steadily high. The animal was given an intramuscular inoculation of 30cc gas gangrene antiserum and recovered after five days.

A cruel, but a safe procedure following castration, is to tie the animal so that it cannot lie down until the operative wound has healed. Naturally only a green laxative diet is allowed.

Nowadays with penicillin and sulfa drugs available no serious outcome of any complication is to be expected.

10. Diseases of the Eye

(a) *Conjunctivitis.*—Catarrhal inflammation of the conjunctivae (acute and chronic) and follicular inflammation are the commonest eye ailments in Egypt. When attended to early, hygienic errors corrected (protection of eyes, disinfection and cleanliness of boxes, bedding cleaned and turned over when the animal is outside the box, not while he is in it as is the habit of the vast majority of saysis (grooms) in Egypt) the eye is bathed twice a day with a mild antiseptic oxycyanide of mercury 1:8000 and alternately yellow oxide of mercury ointment 1% and blue eye drops.

In one case the owner was most anxious and over-dressed the horse's eye with strong antiseptics; after some months the eye became worse and on section examination, an epithelioma was reported and the eye had to be extirpated.

(b) *Opacity of the lens (cataract)* is mostly of mechanical origin in horses in Egypt, bad management and at times rough treatment of saysis. This condition improves on alternate applications of powdered calomel, insufflated upon the lesion, and yellow oxide of mercury.

11. Diseases of Limbs

(a) *Sore shins,* sometimes the forelegs show tenderness.

Counter-irritant applied daily for two to five or seven days, until skin commences to peel is sensible, since mild applications simply take a long time, the ailment recurs and the texture of the bone may be affected, streptococcus vaccine is helpful.

(b) *Splints* are best touched once daily for seven days with liquid blister.

(c) *Thrush* is fairly common due to bad hygiene. The lesion being well cleaned, crystals of potassium permanganate are well rubbed in daily with a small hard brush. A few drops of water may be poured on the crystals.

(d) *Inflammation of the flexor tendons,* or suspensory and check ligaments.

This is a more or less common ailment and economically rather serious. The majority of the cases are caused by pulling the horse up quickly.

The flexor perforans tendon is more subject to injury by this cause than the suspensory ligament, and the injury of the tendon is the more serious.

Prognosis in all tendon and ligament injuries must be guarded. Complete rest is essential. Fresh cases in which treatment is begun do better by immersing in cold solutions. When spotted a few days later, hot applications are more successful. A numotizine emplastrum is a great success in the treatment of injured tendons. When the pain passes, gentle massage from below upwards helps to get rid of the swelling. A thickening always remains, however. Counter-irritants in the form of a blister bandage is the best in old thickenings. If the animal goes lame again, the horse will never be properly fit for racing. Ruptured tendon fibres in Arab horses do not heal perfectly as is the case with thoroughbreds.

Most cases of inflammation of the flexor tendons are a result of pulling up the mount suddenly. It is a serious injury

12. Intestinal Worms

Ascarids and strongyles are the commonest intestinal invaders of race horses in Egypt. Except when they are present in great numbers they cause little or no damage. Diagnosis is made by the intermittent appearance of ova in the feces; Sheather's flotation method was always adopted in fecal examinations.

Fasting the animal 12 hours then given a drench of turpentine, ammonium carbonate and linseed oil constitutes a satisfactory treatment. It may be repeated after 10 days if necessary.

Treatment of Mastitis in Dairy Cows with Penicillin*

By K. D. DOWNHAM and G. J. CHRISTIE

IT has been found possible in the past to reduce the incidence of clinical and sub-clinical mastitis by regular bacteriological examinations of milk samples to indicate which infected animals should be removed from the herd and which should be milked last.

Treatment by chemotherapy has altered the outlook with regard to the treatment of mastitis. Many substances have been investigated but, until penicillin was tried, none had proved to be of outstanding value. Sulfanilamide and related compounds have been used successfully on a considerable percentage of animals suffering from mastitis due to streptococci, but their extended use has shown that sulfanilamide tolerant strains are liable to develop. With the advent of penicillin, however, a new approach to the whole problem was opened.

The investigations on which we are now reporting began in 1942. Our scope was restricted for a time by the limitation of supplies of penicillin available from a development process plant, but later it was possible to make a more extensive study. The results will be published in detail in due course, but meanwhile it is thought that their encouraging character justifies a preliminary report.

During 1945-46, when a larger quantity of penicillin became available for experimental use, 64 animals suffering from streptococcic mastitis were treated with penicillin, 75% of which were cured, both clinically and bacteriologically.

A series of tests was carried out to determine the best method of administration, and these trials showed that the method of infusing the udder with 30,000 units of penicillin on two occasions at intervals of 24 hours, was the most practicable and satisfactory method.

It was found that the infusion of penicillin in this concentration did not produce any noticeable irritant effect on the udder tissue and except for the presence of a few clots in the milk, which occurred on rare occasions, adverse effects were not observed. The second infusion would appear to eliminate the possibility of the continuance of infection due to organisms which may persist.

Method of Administration

From 1942 to the end of 1945, the calcium salt of penicillin was used; thereafter the sodium salt. Both types of preparation were received in the form of a sterile powder, and were stored in a refrigerator. For use the material was dissolved in sterile normal saline solution or later in sterile distilled water.

The present method of administration is to dissolve 120,000 units in 400cc of sterile distilled water, which is sufficient for treating all four quarters of the cow on one occasion. The apparatus used consists of a wide-mouthed glass container, marked in four divisions of 100cc, to which is attached a rubber stopper, perforated to hold two lengths of either metal or glass tubing, one of which extends to the base of the jar and the other ending just below the rubber stopper. To this short arm is attached rubber tubing, ending in two rubber pressure bellows similar to those used for inflation of the udder when treating cases of milk fever. To the long arm rubber tubing is attached, into the other end of which is plugged a teat syphon. The apparatus is sterilized before use and separate sterile teat syphons are used for each quarter of each cow. A metal clip is attached to the rubber tubing

Courtesy Lederle Laboratories

Growing Mold, *Penicillium Notatum*

*Reprinted from *The Veterinary Record*, 58:44, p. 475. 1946.

close to the milk syphon to prevent backflow of milk from the quarter after the infusion.

The most convenient time to treat an infected cow is shortly after milking. The udder and under surface of abdomen are washed with an antiseptic solution and dried. The teats are then stripped into a bucket containing antiseptic solution and each teat is swabbed with spirit. After infusion penicillin is allowed to remain in the udder until the cow is next milked. Twenty-four hours later the same procedure is carried out.

It has been found that 75% of the animals treated have remained free from infection, including one or two cases which had been infected for over 12 months, in spite of the fact that many of those treated had proved to be resistant to other forms of treatment for several months.

Large doses of penicillin have been administered to cows which failed to respond to the above method of treatment, and in some cases 120,000 units have been used on each quarter of each cow, without clearing up the infection.

In our hands penicillin has been highly successful in the treatment of cows suffering from streptococcic mastitis. At least 75% of all cases suffering from this type of the disease have been successfully treated, the assessment of the value of the treatment being judged according to the result of four bacteriological examinations of milk samples at weekly intervals after treatment.

Experimental work is being carried out to determine whether it is possible to treat successfully the relatively small percentage of cases of *Streptococcus agalactiae* which fail to respond to the treatment we have adopted.

For practical purposes it would appear that 25,000 units per quarter is an effective and practical dose for routine treatment.

Staphylococcic Mastitis

Experiments are in progress upon the treatment of mastitis and it would appear that

After infusion penicillin is allowed to remain in the udder until the next milking

larger dosage may be necessary for the successful control of this disease.

Mastitis Due to Corynebacterium Pyogenes (Summer Mastitis)

The treatment of summer mastitis in dry cows according to the method described under streptococcic mastitis, has not proved to be successful. Research in the control of this type of the disease is being pursued but up to the present no quarters have been treated with complete success.

* * * *

Tissues Reaction to Vaccines

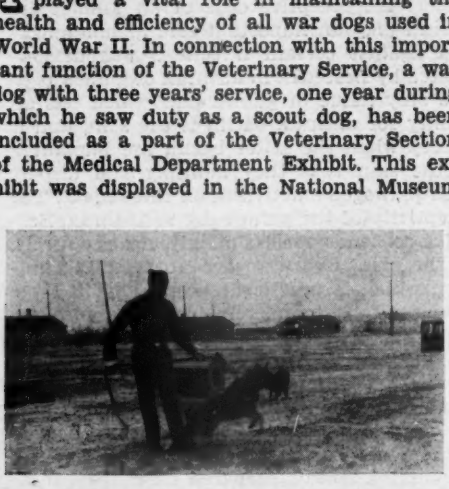
That the receptive cells of an animal organism play an important role in immunization against certain infections was demonstrated by Besredka in anthrax of guinea pigs. The only tissue of guinea pigs which has an affinity for anthrax bacilli is the skin, and it is only when the latter bacilli are implanted in the skin that they multiply and display their pathogenic activities on this rodent. The receptivity of the guinea pig to anthrax, Besredka contends, resides mainly, if not entirely, in the skin. Subcutaneous anthrax vaccination, which is practiced successfully in large animals, fails completely in guinea pigs. By applying the vaccines to the shaved skin or by inoculating the vaccines intradermally Besredka was able to confer active immunity to guinea pigs. His procedure of strenthening the specific sensitive cells by inuring them to pathogens through direct local application of attenuated strains prepared from the causative agents, proved successful also in infections due to staphylococci and streptococci and to dysentery bacilli and Salmonella.

In brucellosis the receptive cells are likely to be located either in the mucosa of the uterus or in both the uterine mucosa and the udder, that is in the two organs which carry the burden of pregnancy and lactation. Actually *Brucella abortus* organisms are isolated mainly from the uterine discharges and the milk of cattle affected with brucellosis. The infection of the fetus and the newly born calf takes place through these channels. Furthermore Birch and Gilman[1] have observed that *Br. abortus* organisms, which had been introduced intravenously or *per os*, locate mainly in the uterus and supramammary lymph nodes. If Besredka's theory holds also for brucellosis there is a chance that active immunity brought about through direct impregnation of the receptive cells with attenuated organisms like Strain 19 might confer a stronger resistance to the disease than the subcutaneous or intracutaneous methods of vaccination which are being practiced at present.—*Alberto A. Ascoli.*

[1] Birch, R. R., and Gilman, H. L. The agglutination test in relation to the persistence of *Br. abortus* in the body of the cow. Ann. Rep., N. Y. State Vet. Col. for 1929-1930.

Veterinary Service for The K-9 Corps

THE Veterinary Corps, United States Army, played a vital role in maintaining the health and efficiency of all war dogs used in World War II. In connection with this important function of the Veterinary Service, a war dog with three years' service, one year during which he saw duty as a scout dog, has been included as a part of the Veterinary Section of the Medical Department Exhibit. This exhibit was displayed in the National Museum



The attack dog was trained to seize the right arm of an adversary thus disarming him. In the event of a continued struggle the dog would attack the throat

of the Natural History Building, Smithsonian Institution, Washington, D. C., from 6 January to 5 February, 1947. It was then moved, intact, to the Pentagon Building Concourse, where it will be displayed for one month, beginning 10 February.

Eighteen-thousand dogs were acquired for the Army during World War II by the Remount Branch of the QMC which gave them basic training and issued them to the troops. Prior to that time, dogs had not been included in an official War Department activity and, therefore, none had been acquired by the Army. Consequently, there were many problems incident to the establishment. Among these problems may be listed supply and equipment for care and handling of dogs, training of war dog handlers, shelter, transportation, size, types, and use of various types, of war dog units, prevention and control of infectious and communicable diseases incident to assembling dogs in large numbers, shipment and subsequent use in foreign countries, where many canine diseases are prevalent which are not indigenous to the United States. During World War II, war dogs were used for many purposes, chief among which were: sentry, attack, and scouting duties, etc.

Germany used dogs extensively in World War I and continued to build her "dog Army" until she had 50,000 trained dogs on duty when World War II started. Germany gave Japan 10,000 trained dogs during the recent conflict, which Japan used in the China, Burma, and Pacific campaigns. Russia and Britain also used war dogs in large numbers. Their role was varied. The use of war dogs by the enemy was first observed in the desert warfare in North Africa when the enemy employed dogs to point out our concealed machine gun positions and outposts. They were also used to carry light ammunition and machine guns, as sled dogs, first aid dogs, wire laying, guard and mine detecting, detecting chemical agents, dogs as messengers, and as spotters for wounded men in the field.

It is a well-known and generally recognized fact that a war dog must be in the "pink" of condition, both mentally and physically, at all times. If the special senses and preceptions

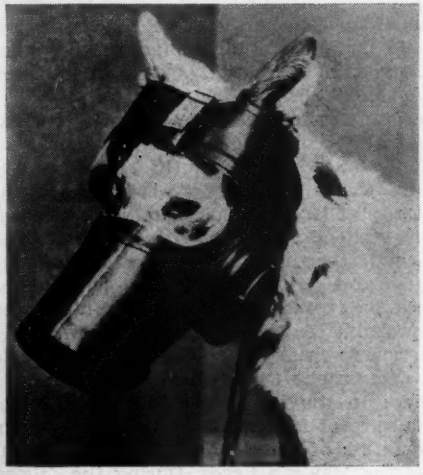
Signal Corps, U. S. Army

Stringing telephone communications wire between outposts

which make the dog so valuable to the Army are impaired, his value and usefulness are seriously affected. To maintain these dogs at a high peak of efficiency, a definite and workable plan was devised by the Army Veterinary Service. The main objective of the plan of the Army Veterinary Service pertaining to the War Dog Program consisted in establishing measures for the prevention and control of animal diseases that would cause animal inefficiency or might be transmitted to troops, as well as medical and surgical treatment to individual dog patients. There were four diseases of dogs that became of considerable military significance with the institution of the War Dog Program. These diseases were: rabies, canine distemper, canine leptospirosis and canine filariasis. Rabies and leptospirosis are transmissible to man. Canine distemper and canine filariasis are highly infectious among dogs, one being readily controlled by vaccination and sanitation and the other being very difficult to control. The control of these diseases in overseas theaters presented a far more difficult problem than in the United States. For example, war dogs obtained from civilian owners in the Hawaiian Islands and trained by the Army, were not immunized against rabies because this area is one of the few rabies-free countries in the world. It is known that rabies is prevalent in all countries except England, Australia, New Zealand, and the Hawaiian Islands. In many overseas theaters, our war dogs were exposed to other communicable diseases which do not exist in this country. Likewise, in many foreign countries where our war dogs were used, there is no system of control for the many prevalent and highly contagious diseases of dogs. These war dogs were loaned, or donated, to the Army, by civilian owners and represented not only a financial investment, when trained, of not less than two million dollars but also proved to be a valuable asset to war objectives of the nation and contributed materially in the successful accomplishment of our mission—to defeat the enemy.

U. S. Army Signal Corps

The war dog's usefulness depended upon keeping him in the "pink" of physical and mental condition



Army Signal Corps Photo

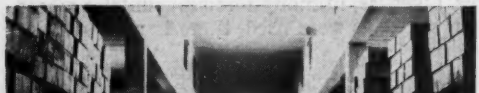
GAS MASK FOR WAR DOGS

The illustration shows a gas mask developed by the Army Chemical Warfare Service for the use of War Dogs. The mask weighs two pounds and affords protection against chlorine, phosgene and other suffocating gases. It takes a short time to train dogs to wear this gas mask without protest. A transparent plastic window permits the animal to have unobstructed vision

The establishment of new foci of infection of canine filariasis, canine leptospirosis, and other canine diseases in the United States at the time of demobilization and return of dogs to their original owners presented a veterinary and public health problem of national importance. Many animals recover or can be successfully treated for these diseases, but some continue to be infected and spread the disease. Only those war dogs which had been proved, by the latest and most scientific methods, to be free from infectious and communicable diseases, were released to their civilian owners by the Remount Service which was responsible for deprocessing and detraining. Through the application of sound, time-proven principles of military preventive veterinary medicine, it was possible to avert a spread of diseases to our canine population, which would have jeopardized, also, the health of our civilian population through the introduction of diseases unknown in this country.

Veterinary Report Reflects Benefits of Army Food Inspection Program

The effectiveness of the Army Veterinary Corps food inspection program is attested by the fact that no serious, widespread outbreak of disease traceable to the issue of unwholesome meat, meat-food and dairy products has occurred among United States Army troops in the past several years, Colonel James A. McCallam, Chief, Veterinary Consultants Division, Office of The Surgeon General, stated recently.



The Army Veterinary Service periodically re-inspected billions of pounds of government-owned food in storage

The Veterinary Corps in a report for 1946 announced that it inspected and passed, at time of procurement by the Government, 1,368,412,978 pounds of foods of animal origin. 40,042,009 pounds of foods of animal origin were inspected and rejected at time of procurement for non-compliance with type, class or grade, and 6,180,674 pounds of foods of animal origin were inspected and rejected at time of procurement as being insanitary or unsound.

These totals include inspections made for the Navy, Marine Corps, Coast Guard and War Shipping Administration, but do not include the billions of pounds of government-owned foods re-inspected in storage, during shipment, and at time of issue. Nor do they include other foods, which are inspected by the veterinary service on orders of local commanders.

A great saving is also made for the Government by the careful repeated inspections by the Army Veterinary Service on the vast stores of perishable as well as canned foods held in storage by the Government, to detect early deterioration or improper storage conditions, thereby making it possible to take corrective action and dispose of foods economically before spoilage occurs. This has been of paramount importance in overseas theaters where, during 1946, millions of pounds of foods were still in storage following the end of the war.

Large Scale U. S. Aid Sought for Control of F & M Disease in Mexico

The prospects of early eradication of foot-and-mouth disease from Mexico is not promising, according to a report of the Mexican-United States Commission which deals with agricultural problems affecting the two countries. This commission asks large scale U. S. aid in eradicating the disease; estimating the cost at from 100 to 200 million dollars. The infection has already spread over an area of more than 100,000 square miles and is declared to constitute "a grave danger to the livestock industry of Mexica, the United States and other countries."

The commission's recommendations are based upon the report of a subcommission comprised of U. S. and Mexican veterinarians. Drs. S. O. Fladness and M. S. Shahan of the B.A.I. are the U. S. members. It states the facilities of Mexico alone are "insufficient to cope successfully with this disease which constitutes an international problem." It will be recalled that a year ago when the United States Government protested the importation of cattle from Brazil into Mexico it was thought to be very much of a domestic problem by the latter country.

USDA officials have already taken measures to render all possible aid to Mexico within the limits of their authority. The B.A.I. has organized its manpower and equipment in readiness to handle the situation should the disease breach the border barrier.

The Congress is asked to authorize the expenditure for the eradication of this outbreak of foot-and-mouth disease in Mexico on the ground that if the disease becomes permanently established in that country it will constitute an enduring hazard to our own livestock industry and entail an expense for quarantines and otherwise guarding against the disease that would, in the long run, far exceed the probable cost of eradicating it now.

To review briefly the events leading up to this catastrophe to the livestock industry of Mexico: In the fall of 1945 the secretary of agriculture of Mexico launched a program of importation of Zebu bulls from Brazil to improve the Mexican herds. During the following winter Brazilian cattle were landed on Sacrificios Island off the coast of Mexico and quarantined there. In April it was learned they were to be taken to the mainland and the U. S. government protested this action, holding it to be a violation of the U. S.-Mexican Sanitary Convention. The cattle were landed anyhow and June 15, the U. S. closed the border to cloven hoofed beasts from Mexico.

Quarantine was lifted October 18 and re-imposed December 27 when foot-and-mouth disease was diagnosed in Mexican herds.

Veterinarians and Artificial Insemination

The artificial insemination of dairy cattle has developed rapidly in Canada during the last five years. Artificial insemination units have been established in the main dairying areas of all the provinces and in most instances have proved successful, expanding in services from year to year. Some of the success of these breeding projects must be attributed to the fact that veterinarians have been placed in charge of the technical procedures involved in artificial insemination.

The value of artificial insemination to the dairy cattle breeder has been clearly shown in the results achieved by the work of units. These results have stimulated breeders outside the unit areas to look for some form of artificial insemination service. Consequently veterinarians are frequently requested to render services of this nature. Many veterinarians in spite of the fact that they have more work to do than ever before, have readily accepted artificial insemination and gradually it is becoming a part of every day practice. There are several advantages in this work. The veterinarian is able to diagnose and treat more cases of infertility, in many instances prolonging the life and usefulness of a cow that would otherwise have been slaughtered. In addition, it is a procedure whereby the veterinarian may be assisting in the control of an infectious disease by performing the insemination properly, and the owner will be appreciative. Furthermore, there should be some satisfaction from the improvement noted in the resulting offspring sired by semen from superior sires. The remuneration derived from artificial insemination work is by no means small. Most of the artificial units have an advantageous salary scale, pay mileage, and with some units permit sterility treatment fees. Possibly one reason for lack of interest in this work has been the inability on the part of the practitioner to obtain semen. This reason may be obviated by the fact that sufficient units have been established in most of the provinces to provide occasional semen samples. Agricultural institutions have also undertaken to provide semen to a limited extent for custom service and thus there should be available through either of these a supply of semen.

W. H. R. ROYALMIX
Semen from this purebred Hereford bull was used to inseminate 827 purebred Hereford cows from April to September, 1945

If veterinarians take advantage of the opportunities provided by artificial insemination work they will soon find a large clientele waiting for their services.—*C. A. V. Barker* in the *Canadian J. of Comp. Med.* 10:10. 1946.

Collected Papers on Artificial Insemination

Collana Tecnico Scientifica "L. Spallanzani" No. 1, 2, 3, 4, edited by the "Istituto Sperimentale Italiano "L. Spallanzani, Milan, Italy.

1. T. Bonadonna. Sulla stimolazione del riflesso dell 'accoppiamento del maschio mediante il manichino (On the stimulation of the mating reflex in the male by the dummy).

2. T. Bonadonna Attitudine del maschio alla riproduzione: controllo dello sperma 174 pages, 1944. Price 100 Lire.

3. T. Bonadonna Tecnica ed Economia della riproduzione degli animali domestici 206 pages, 1945. Price 150 Lire.

4. T. Bonadonna e R. Bovati Opere, studi, ricerche e note edite in Italia dal 1914 al 1945 sulla fecondazione artificiale negli animali domestici 294 pages. 1946 .

The first volume of this collection is not presently available to the writer.

The second volume provides exact information on the control of the semen used in artificial insemination. The knowledge in this field, that in Perry's "The Artificial Insemination of Farm Animals," is condensed into few pages is comprehensively treated in Dr. Bonadonna's dissertation of 174 pages. The usefulness of this monograph lies in its thoroughness since the control of the semen is implemented with the control of its fertility and of the genital function as well. This task is accomplished by dividing the subject into 18 chapters, each dealing with a different aspect of the problem. The intrinsic value of the work is increased by the circumstance that the Italian experimental contributions to the morphology and staining characteristics of spermatozoa, *e.g.* Fumagalli's research work on the extratesticular maturation of the spermatozoa of the bull, are fully reported and illustrated in beautiful color plates. The bibliography (15 pages) is also prepared with great accuracy.

The third volume of the collection gives

ample information of the technics and the knowledge available for an economically profitable breeding. The book is divided into three parts. The first deals briefly with the criteria, which ought to be depended upon. In the second and third parts the reader is given ample data on the estrous cycle and the sexual physiopathology of domesticated animals. Each species is dealt with in a separate chapter. Fowls also receive consideration. Italian veterinarians and qualified technicians as well as farmers will welcome the book as a useful guide in their efforts to restore the livestock industry of the new republic.

Volume No. 4 of the collection offers an impressive picture of the activities displayed in Italy from 1914 to 1945 in the fields related to artificial insemination. This is done by abstracting the books and reports on the subject, including the one presented by Perry and Bartlett at the Foggia meeting in May 1940, and proceedings of meetings, papers, and articles which have been issued in Italy during the last 40 years. Since the gates to investigation of artificial insemination were opened by Italian physiologists, the publication of such a survey is not preposterous. The first scientific research in artificial insemination was conducted in 1780 by Spallanzani, we wonder if even experts in this field had ever been told that the original idea for the artificial vagina, which marked a new milestone in the practice of artificial insemination is traced to Amantea's technic of introducing into the vagina of a bitch in heat a small thin rubber bag where the semen ejaculated by the male was collected.

Among other interesting observations, abstracted in this volume are Vighenzi's records of pregnancies occurring in cows artificially inseminated after all symptoms of heat had disappeared. Incidentally this seems worthy of further investigation. At this time when sulfa drugs are widely used, the research carried on by Comi on their elimination is looked upon as a useful contribution. One is gratified by the finding that the drug does not harm the spermatozoa *in vivo* nor *in vitro*. The need of adequate nutrition for the normal development of spermatogenesis is stressed in many papers and so is the importance of other factors, as well as technical improvements, which have been worked out by Doctor Bonadonna and some practitioners. The discovery of Fumagalli that a ripening takes place in the head of the spermatozoon of the bull during its passage through the genital tract overshadows however in my mind the practical contributions, for it is bound to throw a new light on the whole problem of spermatogeny.

Each abstract is presented both in Italian and in English. Therefore American experts and researchers are given the opportunity to become acquainted with the new work accomplished by fellow citizens of Spallanzani in the country where artificial insemination originated.—ALBERTO A. ASCOLI.

* * * *

If we could breed even 25% of the cows to proved sires—a percentage now possible through artificial insemination—we would increase production more in the next 10 years than in the past century.—*Clinton P. Anderson, Secretary of Agriculture.*

* * * *

Pharmaceutical By-Products of Meat Animals

Insulin is the most valuable medical by-product of the meat packing industry. The lives of 800,000 persons in this country depend upon daily injections of this product. It requires the pancreas of 40 beeves to keep one diabetic alive for one year. The demand for insulin is increasing not only because of the increase of the population and of the number of diabetics, but also because diabetics survive four times as long now as formerly and there is thus an accumulation of them. The demand for insulin has already reached a point where it is important that the pancreas of slaughtered animals be saved wherever possible. Only the large packers prepare glands for insulin manufacture. The process requires that they be removed from the carcass immediately the animal is dead and freed of fat and quick frozen without delay. They must remain solidly frozen until used. The price of cattle pancreas at the present time is 17 cents, of swine pancreas five cents and of calf pancreas four cents each.

Liver is another pharmaceutical by-product of the meat packing industry. Prior to 1926 livers had little commercial value, but in that year it was discovered that persons having pernicious anemia who, theretofore, could exist only in a state of chronic invalidism, could lead normal lives by eating raw liver or taking liver extract. Livers at once assumed high commercial value and all the research of recent years, designed to determine the cause of liver abscess and of telangiectasia, stems from this discovery of the usefulness of liver in the treatment of pernicious anemia (and other anemias also).

Other pharmaceutical glands of meat animals include the thyroid glands, the parathyroid glands, the suprarenal and the pituitary glands and ovaries. In addition gastric mucosa, bone marrow, ox gall and sheep gut have medical uses.

Swine Parasites and Parasitisms

SWINE like man and other animals are hosts to many parasites. Eighteen genera and 30 species are said to prey upon the swine in this country. Fortunately about one-third of them are of little or no economic importance. Mönnig lists 48 species as occurring in swine.

Each parasite has a preferred habitat. A place where it sets up housekeeping when it is able to choose freely. However, many locate more or less temporarily in other sites when, because of crowding or for other reasons, the preferred site becomes unsuited to them, or they are unable to reach it.

In the adult stage three species of swine parasites live on the skin; three have a predilection for the lungs and an equal number choose the stomach. Two (flukes) prefer the liver. The tongue and esophagus hold the greatest attraction for one species each. The small intestine attracts four species, while the large intestine is home to three genera, including six species of protozoa, two of coccidia and one of Balantidium. In addition the larval stage of the Trichinella prefers muscle tissue and the larval stage of the dog tapeworm finds the most attractive living quarters in the peritoneal cavity. Certain other swine parasites lead a nomadic life in the larval stage, bivouacking where night overtakes them.

Only exceptionally do the internal parasites of swine complete their life-cycle in a single animal. Nearly all leave the parental roof at an immature stage in their development, usually the egg stage. They escape into the wide open spaces with the feces or the urine or otherwise; the desideratum being to gain access to a new host and set up an assembly line for mass reproduction. Compared with the sheltered life within the body of its host, the free life of the parasite on the outside is a rigorous one, but the egg and embryo stages are well adapted to it. In these stages many parasites are very resistant to unfavorable environmental factors. They survive a Minnesota winter or an Alabama summer; great cold, much drying, long continued soaking, considerable heat and most disinfectants. The egg or larva of some of the toughest may remain viable for years if no suitable host comes along to ingest it.

In addition to surviving climatic and other hardships the young parasite, to succeed, must sooner or later acquire a new host. This may present great difficulty, and is provided for by giving the species an inconceivable number of chances. A female ascarid for example will produce 25 million eggs in her lifetime and sometimes 250,000 in a day! Two circumstances greatly aid the parasites of domestic animals in finding a new host. One is the animal's habit of defecating and urinating on his dinner table and the other is man's practice of confining his animals in small areas where the parasites can contact them readily.

Nearly all methods for parasite control are based upon a knowledge of their life history. The preferred place to break the chain of parasitism is outside the body of the host. There are a few special cases like the flukes which must sojourn in a host of another species, and the dog tapeworm whose great object in life is to be ingested by a dog which lives upon slaughterhouse offal and the trichina worm which depends, in the struggle for existence, upon being ingested in raw or undercooked pork by a person, probably one who has a habit of stopping at roadside hamburger stands and eating sandwiches containing uninspected meat. Parasite eggs will not incubate at body temperature. They must leave the body of the host and develop infective embryos in the open. Lungworms constitute a partial exception to this rule. Then when these embryos are ingested by a suitable host the enclosing membrane, the egg "shell," dissolves and the embryo is set free to continue its development, which usually includes a period of wandering about the host's anatomy.

The *Ascaris suis* is the commonest helminth of swine. Its distribution is universal. Mor-

Ascaris lumbricoides.
a, male; b, female. Four-ninths natural size. From Neveu-Lemaire.

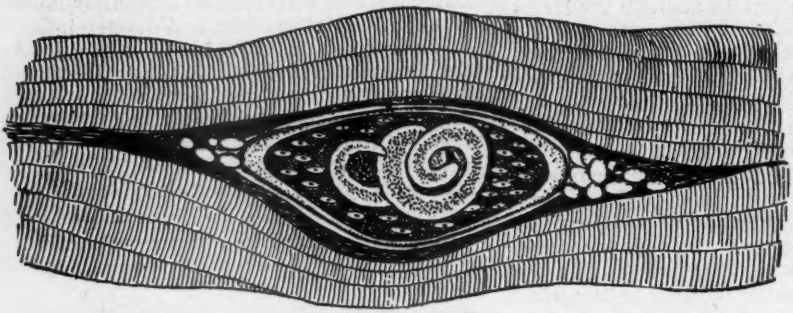
phologically and serologically it is indistinguishable from *Ascaris lumbricoides*, the common roundworm of man and certain large apes. However, the suis and lumbricoides must be regarded as different varieties of the same species, since an exchange of hosts by this species occurs, if at all, only under exceptional circumstances. The life history of the Ascaris is more completely known than of most other

parasites of swine, and may be considered more or less typical for intestinal helminths of all domestic animals.

When embryonated Ascaris eggs, that is eggs in which a certain amount of development of the embryo, including one molt, has taken place outside the body of the host, are ingested by swine the "shells" are dissolved within three days, setting the embryos free in the intestine. These embryos are microscopic in size and capable of migrating through the tissues readily. They migrate widely through the tissues of the host. Perhaps few parts of the body, other than the bones, escape a visit by at least some of them. But the majority penetrate the bloodvessels and hitch hike on the bloodstream to the liver. Later, by the same means, they reach the right heart and thence the lungs, where a great many of them abandon their nomadic mode of life, preëmpt claims and settle down to the serious business of living, i.e., reproducing their kind. This migration is not to be thought of as a direct, intelligently directed journey from the intestine to the lungs, but as encompassing all manner of delays and side trips into and out of the blood stream and various tissues along the way. Large numbers never reach the lungs, but set up housekeeping in the muscles or other tissues where, generally, they do little damage to the host. However, if they locate in the brain or heart they may do serious damage. Many that do reach the lungs pass on through them to other tissues, thus missing their one opportunity to perpetuate the species.

Even when the embryo ascarid has survived the hazards of the egg stage and has been ingested, in its food or water by a suitable host, life for it is not all beer and skittles. If it fails to reach the lungs it is doomed to a short and futile existence. Furthermore all hosts possess an inherent means of combatting their parasites. In the mature animal this protective quality may destroy all of certain parasites that invade it. In the case of the Ascaris, the well developed pig, six months of age or older, possesses so much "immunity" that only a small proportion of the embryos that invade it attain maturity. In all animals the young are more susceptible to parasitic invasion than the adults, i.e., all animals develop a greater or lesser degree of age immunity or tolerance for parasites. In most species it is readily lessened by inadequate nutrition, physical hardship, disease exposure, etc.

When Ascaris embryos reach the lung the majority of them leave the blood stream and migrate to the alveoli where they grow rapidly for from one to three weeks. Having reached a length of 0.7 to 1.5mm (about one-thirty-second to one-sixteenth of an inch) and become visible or nearly so to the unadorned oculus, they ascend the air passages to the pharynx and are swallowed. On reaching the intestine the worm develops to the adult stage and begins to seed the country side with millions of eggs thus completing its life cycle. Even in its prosaic adulthood Ascaris do not entirely abandon their habit of wandering. Some of them work their way into the stomach and are occasionally vomited, others sometimes proceed up the bile duct,, obstruct it, causing jaundice. Rarely they perforate the intestinal wall and cause peritonitis.



Trichinella spiralis.
Larva encysted in muscle. Enlarged, From Ransom, after Leuckart.

It is during the sojourn of Ascaris in the lungs that the chief harm is suffered by the host. Here the parasites cause small hemorrhages into the alveoli and bronchioles, which are followed by secondary infection and more or less severe pneumonia in young pigs. Stunted growth, loss of condition, coughing, an exudate from the lungs and "thumps" are the principal symptoms of this invasion. The economic loss is heavy, due to failure of the afflicted pig to thrive. It thus wastes much of the feed it consumes. The death loss is unimportant, i.e., the direct death loss. Indirectly, the death loss may be heavy, since heavily parasitized pigs are not immunized when vaccinated for the prevention of hog cholera and may later die of the disease. In a very real sense such deaths may be said to be due to

the parasitic invasion. Also anemic pigs may succumb to ascariasis. Just how to apportion the loss is hard to say.

There is just nothing to be done about an ascarid infestation from the time the larvae leave the intestine until they return from the lungs to develop into adults. That is, nothing except to feed and care for the pig in the best manner possible. The higher the plane of nutrition the greater the tolerance of the animal for, and resistance to, parasites.

The final stage of the Ascaris in the intestine seems to cause swine little inconvenience. One cannot quite believe that they do not harm the animal, but even a heavy intestinal infestation does not prevent shotes from growing rapidly and fattening readily. One often sees thrifty, well fattened hogs that, when slaughtered, are found to have the small intestine literally packed with adult ascarids. At this stage the animal can be freed of its parasites, to a large extent by anthelmintic treatment, but it is too late to benefit it much, since the major damage has been done. It is true many chronically unthrifty pigs are heavily infested with mature ascarids, but that the stunting is due to the parasites needs more proof than has yet been furnished. However, in addition to whatever benefit freeing it of ascarids may do the infested animal, it also lessens the crop of parasite eggs and the contamination of the premises, and thus is a sanitary measure of importance.

Phenothiazine can be given in the feed, and is therefore easy to administer, but its efficiency against Ascaris is not high. Toxic effects are sometimes reported from its use in swine, but if they occur they are not common. Of the older ascaricides, the choice is still oil of chenopodium for small herds. It has to be administered to the animals individually and that becomes an onerous task in herds containing hundreds or even scores of animals.

Swine should be kept off feed for 24 hours before they are given oil of chenopodium. Allow them all the water they want but no feed. The dose for a 50-pound pig is 2.5cc. It should be dissolved in two ounces of castor oil and given with a syringe through the stomach tube. Using one ounce of castor oil and one ounce of mineral oil as the vehicle, reduces the expense somewhat. Unthrifty, puny, hidebound, coughing pigs should receive one-half a dose and repeat it the following day. In cold weather the castor oil needs warming.

Recently Doctor Benjamin Schwartz, of the federal Bureau of Animal Industry, has recommended sodium fluoride, one part in 99 parts of feed for one day, as an ascaricide. It is said to remove a minimum of 90% of the parasites. Sodium fluoride is highly poisonous for most animals but swine are reported to tolerate it well. However, a concentration greater than 1% in the feed should not be employed. Nor should it be administered for more than one day at a time; nor repeated in a shorter period than two weeks. Recent experiments at the USDA experiment station, at Beltsville, Maryland, indicate that skimmilk or whey fed exclusively three days in each month will keep swine practically free of intestinal parasites. Naturally, in view of the present milk scarcity, that has not been a popular treatment this season, but perhaps the time will come again when we shall have plenty of milk for all purposes.

The McLean County system of swine production affords a good measure of parasite control. It is sound in that it lessens the ingestion of embryos. It also provides better nutrition than dry-lot culture and thus increases the resistance of the pigs to the effects of parasitic invasion.

A common condition to be observed on many farms. Pigs root in the wallow for food. Lack of sanitation leads to disease of many kinds. Hog wallows, ascarids and runty pigs are often found together

Newcastle Disease Conference Formulates Research Program

A coordinated Federal-State research program directed toward the suppression of avian pneumoencephalitis (Newcastle disease) resulted from a conference of government and state research workers and others in Baltimore recently. The conference was called by the Bureau of Animal Industry, USDA.

The research covers five main fields of study: One is to determine the losses caused by the disease in various states, in 30 of which the disease has been positively diagnosed and to determine also the efficacy of field control methods. The measures now used include (1) segregation of diseased birds, (2) sanitation and (3) immunization. A second field of research is the development of accurate, rapid, diagnostic methods. A third is to determine the efficacy of various physical and chemical agents for destroying the virus which causes avian pneumoencephalitis. A fourth branch of the research program deals with obtaining more information on the manner in which disease spreads. The fifth field of study is the preparation and testing of more effective vaccines.

The National Committee on Newcastle Disease, which represents all branches of the poultry industry, has been exploring various aspects of the problem and reports an urgent need for the development and application of practical control measures. Besides being highly infective, the disease has a grim history of high mortality in growing chicks and reduced egg production in many affected flocks.

Pending the determination, through research, of the most effective methods for control of the disease, the conference urged that all branches of the poultry industry follow the recommendations already issued by the National Committee on Newcastle Disease and by the Bureau of Animal Industry. The conference recommended further that hatcherymen and other persons who distribute baby chicks and other young poultry undertake a more rigid sanitation program to prevent inroads of the disease and its dissemination. The recommendations included specific measures that are appropriate for the beginning of the hatching season. These are:

1. The hatchery room should be placed under quarantine so that admission is granted only to hatchery operators and chick packers.
2. The hatchery room should be physically isolated by solid walls from all other rooms and provided with a separate ventilation system.
3. No chicks older than 24 hours should be kept in the hatchery room or on the hatchery premises.
4. All hatchery wastes and offal should be sterilized, and the containers used to remove such materials should be sterilized after each use.
5. The hatchery should be thoroughly cleaned and the refuse burned.
6. The hatchery should be disinfected with a solution of one pound of lye per 15 gallons of water followed by compound solution of cresol, or equivalent, usually four ounces to the gallon of water. Empty incubators should be fumigated by a triple strength fumigation, using three ounces of 40% formaldehyde and 1.5 ounces potassium permanganate per 100 cubic feet, with high humidity for 24 hours, then cleaned and fumigated again.
7. Provision should be made for clean outer clothing, disinfected overshoes, and thorough washing of hands for every person entering the hatchery room at each such entrance.
8. All boxes, trucks, tables, equipment, and containers of all sorts in the hatchery should be disinfected.
9. A special room for receiving hatching eggs should be constructed, so that it may be cleaned and disinfected periodically, as provided for the hatchery.
10. Hatching egg cases should be identified and returned only to the farm from which they came.

In case of an outbreak or suspected outbreak of avian pneumoencephalitis in a hatchery or its supply flocks, add the following measures to the hatchery sanitation program.

11. Hatching eggs should be trayed and dipped in an appropriate solution of a quaternary ammonium compound, or chlorine solution in dairy strength. In instances of marked drop in receipts of hatching eggs or abnormally low hatch from a flock owner, investigate. If flock has avian pneumoencephalitis suspend flock as a source of egg supply, and destroy eggs from flock, presently in hatchery.

* * * *

Improved Laryngotracheitis Vaccination

A new swab for use in cloacal vaccination of poultry for laryngotracheitis is recommended by the *Australian Veterinary Journal* (Vol. 22, No. 1). The swab is made by dipping a 2¾-inch splint into a mixture of fine sand and glue. This forms a non-absorbent slightly abrasive head.

Since the swab is inexpensive, it should be used for one application only, thus the danger of carrying infection from one bird to another will be lessened.

* * * *

That hens allowed free access to feeds produced more and cost less was shown by tests conducted by the S. W. Poultry Experiment Station in Arizona.

The cost of feed to produce an average of 182 eggs at 4.4 pounds of feed per dozen eggs was 13.2 cents if hens had free access to feed; but an average of only 124 eggs at 5.6 pounds of feed per dozen costing 16.8 cents were produced when the feed intake was reduced 12½%. Where feed cut was 25% feed cost rose to 20.4 cents requiring 6.8 pounds per dozen, and only 88 eggs were produced. Feed used cost $3 per hundred pounds and eggs sold for 25 cents per dozen.

Gammexane in Canine Practice

Gammexane, one of the newer insecticides, is the gamma isomer of benzene hexachloride. It is a highly potent stomach and contact poison for insects with a low toxicity for invertebrate animals. It possesses a very persistent and unpleasant musty odor. The writer sprinkled a benzene hexachloride preparation on the carpets of his car many months ago to eradicate moth, and the odor persists to this day.

Gammexane is rather quicker than DDT in its insecticidal action and according to Cameron is slightly more toxic than DDT to animals. This author suggests that:

"DDT possesses one advantage over gammexane in that premonitory signs of intoxication due to its absorption are well defined and occur with doses well below the fatal level. We have seen no such safeguarding signs with gammexane; when symptoms appear, the end is usually in sight and little can be done to save the animal.

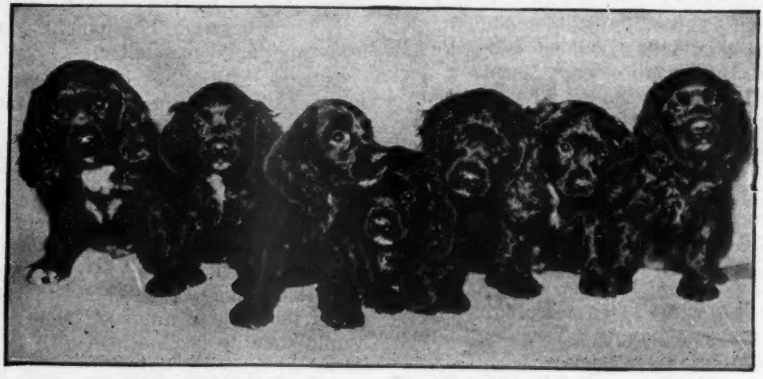
"Symptoms of acute poisoning with gammexane develop fairly rapidly and include the following in this order:

1. Increased respiratory rate, sometimes very considerable.
2. Restlessness, accompanied by frequency of micturition.
3. Intermittent muscular spasms of the whole body.
4. Salivation, grinding of the teeth, bleeding from the mouth and tongue resulting.
5. Backward movement, with loss of balance and somersaulting.
6. Head-retraction, convulsions, gasping and biting.
7. Collapse and death.

"In hyperacute cases, this train of events lasts 40 minutes to two hours; more resistant animals survive 12 to 20 hours. Rarely, death is delayed for several days or even a week; the animal is then very wasted."

The same author, however, points out that skin and oral tests show that considerable amounts of gammexane can be applied to the skin or ingested safely and *"gross carelessness would appear to be the chief source of danger with this insecticide."*

Slade quotes figures showing that crude benzene hexachloride (a mixture of the isomers) given orally to rats, is markedly less toxic than the gamma isomer, and if these figures are compared with those quoted by Cameron it will be seen that the crude benzene hexachloride is significantly less toxic than DDT. Commercial gammexane dusting powders, intended for use on animals, rarely contain more than 5% benzene hexachloride, so that toxicity risks would actually appear to be rather less with gammexane preparations than would be the case with DDT.



Considerable amounts of gammexane can be applied to the skin or ingested safely

Lewis has recorded the successful treatment of 37 cases of sarcoptic mange in dogs using a suspension made from a benzene hexachloride dusting powder. No toxic effects were observed. Apart from this record, however, documented evidence as to the safety of gammexane in canine and feline practice seems to be lacking and extended trial appears necessary. In the case of cats, their licking propensities would render them as vulnerable as they are to DDT. Few manufacturers have as yet marketed gammexane as an insecticide for small animals and in all probability this is due to the unpleasant odor associated with this product.—*Hamilton Kirk*, M.R.C.V.S., in *Vet. Rec.*, 58:43. 1946.

Fffect on Feline Growth of Heat-Processed Foods and Metabolized Vitamin D Milk*

IN the September, 1944, issue of VETERINARY MEDICINE (page 348) a preliminary report was published on the nutritional studies of the requirements of cats in which the comparative value of cooked and uncooked foods was reported. The original experiment stemmed from the fact that great losses were suffered amongst a group of cats upon which adrenalectomies were being performed for the purpose of standardizing adrenal cortex material. In the beginning, the cats were fed meat scraps, together with raw milk and cod-liver oil. In time, more cats were added than could be fed on the available meat scraps, so an order for raw-meat scraps was placed at a local butcher. These scraps included muscle, bone and viscera. This raw meat was fed each day to the same group of cats. Within a very short time the cats in the pens receiving raw-meat scraps survived the operations, the unoperated cats appeared in better health, and the kittens born were vigorous. The contrast in apparent health between the cats in the pens fed on raw-meat scraps and those on the cooked-meat scraps was so startling that a feeding experiment was instituted.

The cats were kept in open-air pens with a yard four feet wide, seven feet high, and 12 feet long, one end having a roof, and a floor with bedding.

A routine procedure was followed with all cats. They were weighed, numbered and described. In the case of donated cats, all possible information was obtained from donors regarding the history of development and type of food the cat had previously received. Each kitten was described and weighed at birth, giving parentage, behavior of the mother during parturition and other pertinent data. Clinical notes continued on all viable kittens. In the case of death an autopsy was performed, cataloguing gross and microscopic findings. Calcium and phosphorus determinations were made on the femur. At the close of the experiment, which ran for ten years, all animals were subjected to post-mortem examination.

In the first series of experiments, one group of cats was fed a diet of two-thirds raw meat, one-third raw milk, and cod-liver oil. The second group was fed a diet of two-thirds cooked meat, one-third raw milk, and cod-liver oil. During the ten-year period of the experiment, approximately 900 cats were studied, upon nearly 600 of which complete records were kept. The amount of accumulated data is large. Only a general resume of predominating findings can be presented here.

The cats receiving raw-meat and raw milk reproduced in homogeneity from one generation to the next. Abortion was uncommon, litters averaged five, and the dams nursed their young in a normal manner. The cats in these pens had good resistance to vermin, infections and parasites. They possessed excellent equilibrium; they behaved in a predictable manner. Their organic development was complete and functioned normally.

Cats receiving the cooked-meat scraps reproduced a hetrogenous strain of kittens, each kitten of the litter being different in skeletal pattern. Abortion in these cats was common, running from about 25% in the first generation to about 70% in the second generation. Deliveries were in general difficult, many females dying in labor. Mortality rates of the kittens were high, frequently due to the failure of the mother to lactate. The kittens were often too frail to nurse. At times the mother would steadily decline in health following the birth of kittens, dying from some obscure tissue exhaustion about three months after delivery. Others experienced increasing difficulties with subsequent pregnancies. Some failed to conceive. For all breeding purposes, a normal, raw-meat-fed male of proved fecundity was used, thus eliminating the possibility of sterility due to the male.

Cooked-meat-fed cats were irritable. The females were dangerous to handle, occasionally viciously biting the keeper. The males were more docile, often to the point of being unaggressive. Sex interest was slack or perverted. Vermin and intestinal parasites abounded. Skin lesions and allergies were frequent, being progressively worse from one generation to the next. Pneumonia and empyema were among the principal causes of natural death among the adult cats. Diarrhea, followed by pneumonia, took a heavy toll of the kittens. Osteomyelitis was common and often fatal. Cardiac lesions, some ascertained clinically during life, were frequent. Hyperopia and myopia,

*Read before Second Annual Seminar for the Study and Practice of Dental Medicine. Palm Springs, Calif., Oct. 9, 1945. F. M. Pottenger, Jr.

thyroid disease, nephritis, hepatitis, orchitis, oophoritis, paralysis, meningitis, cystitis, arthritis, and many other degenerative lesions were observed.

Of the cats maintained entirely on the cooked-meat diet, with raw milk, the kittens of the third generation were so degenerated that none of them survived the sixth month of life, thereby terminating the strain.

One group of cats was fed first on raw meat, then placed on a cooked-meat diet for six months, and then returned to a raw-meat diet. Kittens from females of this group suffered some of the aforementioned stigmas, although the females themselves appeared to be in good health. Their succeeding litters showed irregularities that tended to lessen in intensity for the first two or three years, and then to increase again. The generations following improved as long as they received the raw-meat diet. Their resistance to disease, which was greatly diminished while the cooked-meat diet was being fed, gradually improved, upon their return to the raw-meat diet. They would partially maintain their skeletal form, but their calcification would continue to diminish. Their reproductive efficiency was injured from the standpoint of the size and viability of their kittens, and was particularly noticeable in the failure of the subsequent litters to conform to a homogeneous pattern.

Litters of cats fed raw meat and raw milk averaged five and all had good resistance to vermin, infections and parasites

Cats of the first and second generation of cooked-meat-fed groups were returned to a raw-meat diet. These were classified as "regenerating" animals of the first and second order, first, second, third, and fourth generations.

It requires apparently four generations for either order to regenerate. However, because of the lack of reproductive efficiency, it is only the occasional animal that returns to the normal homogeneous pattern noted before deficiency was imposed on the strain of cats. Improvement in resistance to disease is noted in the second generation-regenerating cat. Allergic manifestations persist. Reproduction is erratic. In the third generation regenerating animal skeletal and soft tissue changes are still noticeable, but to a lesser degree. In the fourth generation, an occasional animal appears to have returned to normal skeletal and tissue form.

At necropsy, cooked-meat-fed females frequently presented the picture of ovarian atrophy and uterine congestion, whereas the males often showed failure in the development of active spermatogenesis. The long bones tended to increase in length in these cats, while diminishing in diameter. It was common to find the hind legs increasing in length more than the forelegs. The trabeculation of the bones became coarser and showed evidence of less calcium. In the third generation of cooked-meat-fed animals, some of the bones became as soft as rubber and a true condition of osteogenesis imperfecta was present.

In the cooked-meat-fed animals, visceral volume decreased, which was evident from the size of the thoracic and abdominal cavities. However, the males on the sweetened condensed milk were overly fat and showed distended abdominal cavities.

Three other series of experiments were made using the following kinds of milk: raw milk, raw metabolized vitamin D milk, pasteurized milk, evaporated milk, and sweetened condensed milk. Roughly the results noted were: animals on raw milk and raw meat reproduced a homogeneous strain, the usual causes of natural death being old age or injuries.

The male cats fed on metabolized vitamin D milk (from cattle fed irradiated yeast) and raw meat showed osseous disturbances very like those on pasteurized milk, while the female seemed unaffected. However, an interesting circumstance occurred in the males fed on this milk. Young males did not live beyond the second month, and adult males died within ten months. The most notable fact was that there is a tendency for the calcium phosphorus ratio to become unbalanced, approaching 2.5:1, as compared with a normal of 2:1. This was

accompanied by osseous changes, including the development of rickets in certain of the young animals. As was pointed out by Becks in his experimental work with dogs, natural cod-liver oil did not appear to inconvenience the cat.

The cats fed pasteurized milk as their principal item of diet, and raw-meat as a partial diet, showed less reproductive efficiency in the females, and some skeletal changes, while the kittens presented deficiencies in development. Cats fed evaporated milk showed even more damage. However, the most marked deficiencies occurred in the sweetened condensed milk fed cats. It is assumed that the excessive carbohydrate in this milk was responsible for much of the heavy damage.

Of particular interest are the dental structures of these animals. The cats fed on the raw-meat diet from generation to generation maintained a regular, broad face with prominent malar and orbital arches, adequate nasal cavities, broad dental arches and regular dentition. The configuration of the female skull is distinct and different from the male, and each maintained the normal outlines. The membranes were firm and of a good pink color, with no evidence of infection or degenerative change. In older cats, particularly the males that had engaged in much fighting, the incisors had often been lost; but in raw-meat-fed cats of raw-meat-fed ancestry, gingivitis or paradentosis was seldom seen.

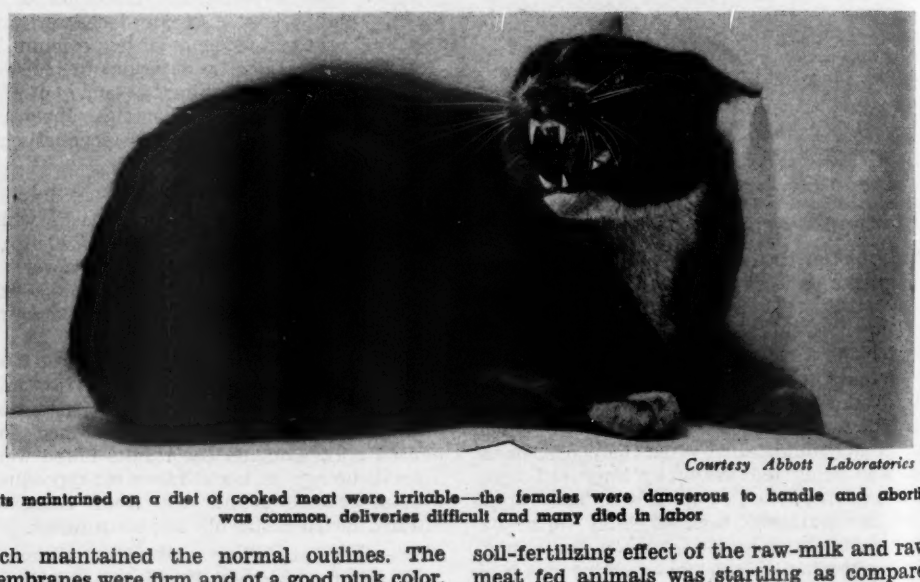
Adult cats placed on a cooked-meat diet began to show unhealthy conditions in the mouth within three to six months. A pregnant cat will show the change more quickly. These cats first present gingivitis, then diminished calcium, paradentosis, abscesses, and finally some shedding of the teeth. The canines are the last teeth to be shed.

The degenerative changes in the skull and mouth grew more pronounced in the third generation cooked-meat cats. The bones were very fine, with scarcely enough structure to hold the skull together.

In the regenerating cats, skull development is still deficient in the second generation, with a universal malalignment of teeth. The third generation regenerating cats show improvement, and in the fourth generation, an occasional cat had a normal skull and dental development.

After the experiments had been completed the pens in which all of the cats had been housed lay fallow for several months. Weeds sprang up in each pen. The fact that the weeds grew luxuriantly in the pen which housed the raw-meat and raw-milk-fed animals, as compared with those which grew in other pens led to another experiment. Two kinds of beans were planted in each pen. The results of the soil-fertilizing effect of the raw-milk and raw-meat fed animals was startling as compared with the sparse growth in the other pens.

The principles of growth and development are easily altered by heat and oxidation, which kill living cells at every stage of the life process, from the soil through the plant, and through the animal. Change is not only shown in the immediate generation, *but as a germ plasm which manifests itself in subsequent generations of plants and animals.*—H. J. MOSTYN.



Courtesy Abbott Laboratories

Cats maintained on a diet of cooked meat were irritable—the females were dangerous to handle and abortion was common, deliveries difficult and many died in labor

Clinical Reports

Unusual Boar Castration

A request to castrate a Berkshire boar one year of age and weighing 250 pounds presented some unusual circumstances. The owner refused permission to employ any anesthesia; the board was in a pen with two shotes and in about one foot of mud; and, externally, he appeared to have a scrotal hernia.

After a good deal of labor I managed to get a hog holder around the boar's snout and cast him in lateral recumbency with a one-half-inch manila rope. The mud was washed from the hind quarters of the animal with a solution of bichloride of mercury and the operative area was painted with tincture of iodine.

A bold incision was made in the scrotum a little to one side of the median raphe. This exposed the right testicle, the tunics of which contained approximately four ounces of a yellow watery exudate. A diagnosis of hydrocele was then made. After severing the spermatic cord with an emasculator it was observed that the inguinal canal was very much enlarged and that the intestines were threatening to force their way through. A second incision was made through the median raphe to recover the left testicle which was very much atrophied. It measured one inch in length, about one-half inch in width and resembled a large lima bean in outline.

The right external inguinal ring was sutured with No. 4 chromic catgut and the area painted with a commercial liquid wound dressing. The animal made an uneventful recovery and when last heard of was doing very nicely.

This case brings up the question of the veterinarian's attitude when his client assumes the perogative of deciding how his animal shall be treated. On one side of the argument, is the fact that it is the owner's animal and he is paying the bill, further he takes full responsibility for the outcome when he directs the work.

On the other side is the probable loss of a client if his request is refused and, perhaps, the feeling that one is not doing what is best for the animal (in this case omission of anesthesia).

Apparently the attitude the veterinarian should take in such cases depends on a number of things and, among others, on what he can afford.

PAUL FRIEDMAN

Danville, Va.

Fowl Pox in Turkey Breeding Flocks[1]

Turkey growers in certain areas have experienced losses from lowered egg production, poor hatches and some mortality due to eye infections and mouth canker in breeders. Investigation has shown that a large percentage of such cases are due to fowl pox virus. In most instances the involved flocks have been vaccinated two times as is recommended.

Recent observations indicate that a single vaccination with a reliable chicken pox vaccine properly applied will last at least six months. To be effective, the second vaccination must be made after the majority of the turkeys have lost the immunity conferred by the first application of vaccine. If vaccinated too soon, no "takes" will result, and efforts of vaccination are wasted because without a "take" there will be no added immunity conferred. It is in such flocks that the eye and mouth infections occur during the breeding season.

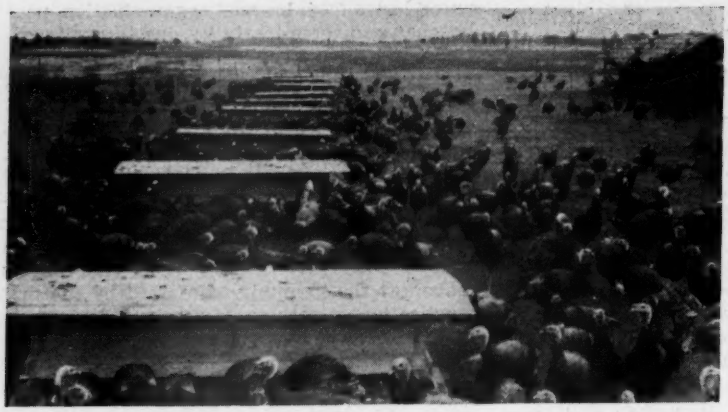
Field studies indicate that the skin of turkeys is protected by vaccination for a longer period than are the mucous membranes of the eye lids and mouth. This accounts for the absence of typical fowl pox lesions on the skin of the head when the eyes and mouth are infected. In the eye cases, yellowish soft scabs form on the inner surface of the conjunctiva and cause swelling, excessive secretions and pain. Casual observations may fail to reveal these pox lesions, since they are usually below the exposed surface and well into the eye socket. The mouth cankers are yellowish, soft to cheesy ulcers, which may affect considerable of the lower mouth cavity around the tongue. Occasionally, in these outbreaks one sees a few small scattered pox lesions on the skin areas of the head, but they heal quickly without spreading.

Toms are more often affected than hens, probably because their tendency to fight increases the chances of infection. In late winter, in certain California areas, mosquitoes are without doubt the transmitting agent.

Prevention of these atypical types of fowl pox can be accomplished by making certain that vaccine "takes" are obtained following the second vaccination of breeders. It is desirable to plan the vaccination program so that at least six months will elapse between the first vaccination of the poults and the revaccination of the breeders. This plan calls for earlier vaccination than is usually practiced in most California localities. If care is taken in handling the poults the first vaccination can be made when they are from six to eight weeks of age.

[1] Fowl pox in turkey breeding flocks. *California Turkey News*, 9:38. 1945.

Even when such a procedure is followed, it is a good plan to make a test vaccination on 50 to 100 hens and at least 50 toms before re-



Many acute cases of fowl pox have resulted from wing web vaccination

vaccinating the entire flock of breeders. These vaccinated birds should all be examined for vaccine takes in about one week. Unless 75% or more show good takes, it is recommended that the remainder of the birds be left unvaccinated for a short period. If no takes are observed in the "test" birds, it is safe to wait an additional month before a second test is made. It is a waste of time, effort, and money to revaccinate if the immunity from the previous vaccination is still active and no takes are obtained.

We do not recommend wing web vaccination of turkeys, because of the danger of spread of the disease following this method, because of the tendency of turkeys, especially young poults, to pick at the developing wing web lesions and, subsequently, introduce the virus to the skin of the head before immunity has developed. Many severe acute cases of fowl pox have resulted in turkey flocks following this method of vaccination. The most satisfactory site for applying vaccine to turkeys is on the non-feathered area of the skin of the upper thigh. This area is covered by a tuft of overhanging feathers and can be easily located.

We have not been able to see any essential difference in the type of vaccine (chick embryo or chicken comb propagated) used, provided it is used according to the manufacturer's direction. Scientifically, the embryo propagated type is to be preferred because it can be made under better controlled conditions.

Favorable results have been observed in the use of "sulfa" ointments in outbreaks of pox involving the mouth and eyes of turkeys. In case of mouth cankers, the yellowish canker should be removed with the aid of a blunt instrument, and the ointment liberally applied and rubbed into the wound. For the eye cases, the ointment should be inserted between the inner lid and the eyeball and spread by gentle manipulation with the fingers. Best results will be obtained by repeating the treatment two or three times daily.

W. R. HINSHAW
Dept. of Veterinary Science,
University of California

Rabies with Atypical Course and Symptoms

November 4, 1946, a male, shepherd dog, three years of age and weighing approximately 65 pounds, was presented for treatment with a history of chewing on wood and tearing the lower boards off a corn crib.

The dog was stiff in the hind quarters and strained a great deal, obviously suffering from constipation. Its temperature was 103°; the eyes reacted to light, and the mucous membranes were only slightly congested. Enemas were given and the animal showed improvement. By the following day the dog ate heartily, appeared normal and was dismissed.

Three days later the animal was returned with a history of his having been normal for two days, but now was again constipated and off feed. The temperature was 103.5° and rectal examination and abdominal palpation revealed an impaction. Enemas were given, with milk of magnesia and mineral oil *via* stomach tube. The impaction which appeared to be mostly hog feces was removed. The following day the animal ate and drank normally but remained stiff in the hind quarters with an arched back. Between feedings the dog continued wood chewing and for this reason was hospitalized for further observation and diet correction. When in a metal cage the dog rested quietly and was not vicious at any time, but when wood was accessible he chewed it.

Minerals and vitamins were administered orally and parenterally. His appetite improved steadily and on the fifth day he ceased chewing wood. Improvement continued until the eighth day. At that time the dog refused food

and water, became weak and salivated excessively. His eyes appeared fixed with the pupils failing to react to light. Death occurred the following morning.

Post-mortem examination revealed no gross pathological lesions, so the head was sent to the state laboratory. The brain was positive for Negri bodies.

The owner later related that the dog had had a fight with a large skunk three to four weeks previously, thus explaining a possible exposure.

GLEN I. CASE

Kewanee, Ill.

A Midnight Call to See a "Beat Up" Dog

Shortly after midnight during a recent cold spell, I was awakened by the telephone's persistent ringing. After answering it and assuring a hysterical woman that I was the veterinarian, she shrilly insisted that I rush right out to her home (16 miles away over fairly poor country roads) to examine her dog.

"My dog has been beaten! I want you to come out right away and examine him so that I can swear out a warrant for the arrest of the men that did it and sue them, etc., etc."

I had a severe headache and plenty of needed sleep still awaiting me, so after learning that the dog was not bleeding, was fully able to walk and otherwise normal, I asked that she wait until the morning for the examination of the dog. She insisted that I come right away, using a very bitter tone of voice that at 12:15 a.m. made my headache worse. This prompted me to state a fairly high fee as my charge for coming out at that hour. The client declared that price was no object, her only concerns being that I come immediately and the suit against those that had "beat" her dog.

The 16 miles from my home were spent griping about the cold weather, the client, the poor road and the probability that the call would prove unnecessary.

I arrived at this lady's home to find about 12 people crowded into the kitchen watching a black cocker spaniel and being regaled with what the woman was going to do to those men who had "beat her dog." She told me that she saw two men leading this dog up the road with ropes tied to him. She went to take the dog from them but it had been hurt so severely that it would not recognize her. Her husband had to go out with some quilts to wrap about the dog so as to avoid being bitten as he was brought inside. "Now Doctor" she said, "He is just all shrunk up with pain."

I examined this dog and found, as the only abnormality, a slight tenderness over both the skull and the sacrum. The owner then demonstrated her knowledge (?) of veterinary medicine to the onlookers by explaining to them that the bruise over the head was responsible for the failure of the dog to recognize her and the bruise over the back was why it was "shrunk up with pain." The point to that repeated "shrunk up" became apparent soon.

Treatment was administered and the fee collected. As I opened the door to leave, a *larger* cocker with different characteristics, expression, etc., ran into the house. The hysterical woman turned red and said: "Why *that's* my dog, I called you out to treat a dog I never saw before." Her discomfiture raised my spirits ever so much more than the sizeable fee had raised them.

S. GLASOFER

Newport News, Va.

Necrobacillosis in a Steer

January 19th, 1947, a yearling shorthorn steer died on the way to our clinic. It was one of a herd of 50 or more feeder cattle and was the only one sick. It had shown depression for about a week, refused feed and appeared stiff and sore. The animal developed a nasal discharge and a slight cough with fast breathing a day or two after the first symptoms of illness were observed.

Hemorrhagic septicemia was suspected by the farmer and the calf was drenched with aspirin tablets in soda water on the 18th.

On post-mortem examination the liver was found to be greatly enlarged with round, dirty yellow, necrotic areas, from one-half to one inch in diameter covering the entire surface. These lesions were without luster, brittle, compact, and some were surrounded by a red zone, others had a connective tissue capsule and a uniform cheese-like dry consistency. There were peritoneal adhesions to the liver covering some of the nodules and caseous material. No calcification was found in any part of the liver. The abdominal cavity contained about a pint of pus and yellow serum, which gave off a sickening, necrotic, fetid odor. There was also congestion in the dependent lobes of both lungs. The bronchi were congested, hemorrhagic, and contained some exudate.

The condition was diagnosed as necrobacillosis of the liver with *Actinomyces necrophorous* as the specific cause. This disease is somewhat common in cattle as a pyemic metastasis in cases of primary metritis or foot rot. All evidence in this case showed the liver condition to be primary.

OLEN PUMPHREY

Fort Branch, Ind.

Abstracts

New Use for DDT

An ordinary nebulizer was used to apply a 5% solution of DDT[3] to the inner surface of the ears of laboratory rabbits suffering from psoroptes cuniculi. The mites were effectively controlled by this treatment.

Stability of Penicillin and Streptomycin in Rubber Tubing

Solutions of penicillin and streptomycin[2] were placed in separate sterile three-foot lengths of various samples of rubber tubing. Assays were made after six hours and 24 hours with *Bacillus subtilis* as the test organism.

Eleven samples of various synthetic and five of natural rubber were tested. Of these, four of the synthetic rubbers inactivated penicillin completely in 24 hours, while two showed 64 and 84% decrease in the activity of penicillin during the same period. Buna S synthetic rubber caused a 50% decrease of activity in six hours and 100% in 24 hours. White surgical Koroseal caused great reduction of activity while black synthetic Koroseal reduced it only moderately.

None of the samples of rubber tubing tested caused any appreciable reduction in the activity of streptomycin.

White Heifer Disease

As a result of considerable investigation the author[52] concluded that this condition, arrested development of the genital system, occurs in 10% of the white shorthorn heifers in Southern England and Wales. It has been reported also from the United States and Africa but not from continental Europe. Being hereditary the incidence of this abnormality must vary greatly from place to place and in different families of the breed. He finds that the condition occurs, but very rarely, in other breeds of cattle and in cattle of colors other than white or near white. While heifer disease is of economic importance only in the shorthorn breed in which the hereditary factor is widely disseminated. It is transmitted as a recessive character and its expression is sex-limited. Since shorthorns of almost any color combination except a red bull bred to a red cow may produce a white calf the factor will be difficult to breed out by color selection alone.

White heifer disease is a name given a condition characterized by antenatal arrest in the development of the vagina, cervix, uterus and/or cornua. The development of these organs is arrested at different periods, with a result that they may exist in any degree of abnormality from near normal development to absence of one or more of these organs. A constriction of the vagina in the posterior third (often referred to as imperforate hymen) is common in these animals.

Some animals with white heifer disease breed; the majority are sterile. In many of them estrus does not occur. Breeding animals with any degree of white heifer disease is inadvisable because of its hereditary basis.

Value of Butter Fats and Vegetable Fats for Growth

Basu and Nath[13] found that butter fat when fed to young rats at 3, 6 and 9% levels induced maximum growth at the 6% level. The growth was poor at the 3% level. Comparative tests were then made with mustard, coconut, sesame and peanut oils and with cow or buffalo butter fats, all given at the 6% level. Maximum growth was obtained with cow butter fat. The growth with buffalo butter fat was slightly less. The vegetable oils gave less growth.—*J. Am. Med. Assn.*

Summer Eczema of Horses

Generalized recurrent eczema is not a rare disease of horses. It disappears entirely in winter only to recur the following summer, year after year. Parasites have been excluded and other local agencies are not always demonstrable. Having dealt with the affliction frequently in light harness horses, Merillat and also Quitman blamed the over-use of body washes and the too free use of the body scraper after work-outs. In the absence of these alleged causes, however, there was nothing left to blame except the vagaries of heredity and allergy. French authorities disapprove the breeding of such horses of either sex, on the ground of hereditary diatheses. Quarante,[4] reporting to the veterinary academy last year sustains the hereditary theory and recommends a treatment which gave interesting results. As a rule, the affliction yields to nothing except the coming of winter. The treatment consists of the intramuscular injection of 100 to 140cc of the patient's blood and the intravenous injection of 60 to 80cc of a 24% solution of magnesium hyposulphite every other

[2] *Science*, 103:2676, pp. 459-60.
[3] Huelsebusch, J. B., Foter, M. J., and Gibby, I. W. Effect of rubber tubing upon the stability of penicillin and streptomycin. *Science*, 104:2708, pp. 479-80, 1946 (Nov.).
[52] Spriggs, D. N. White heifer disease. *Vet. Rec.*, 58:38, pp. 415-418. 1946.
[13] Basu, K. P., and Nath, H. P. Comparative value of butter fats and vegetable oils for growth. *Indian J. Med. Res.*, 34:1, p. 39. 1946.
[4] Quarante, M. Dermatose estivale récidivante de cheval. *Bul. d.l'Acad. d.France*, 19, pp. 177-178. 1946.

day until the total dosage reaches about 350cc of the magnesium solution and 600 to 800cc of the patient's blood. As much as 1000cc of blood may be required to obtain a complete and durable cure. Of 14 cases treated, one was completely cured without recurrence in three years, seven were partially cured, four were ameliorated during the season, and four were refractory.

The Common Squirrel, a Reservoir for Thorny-Headed Worm

The fox squirrel and chipmunk are reported[14] parasitized by *Macrocanthorhynchus hirudinaceus*. That the fox squirrel seems a satisfactory host for this roundworm is considered important, since it could serve as a reservoir host for infection of pigs.

***Macracanthorhynchus hirudinaceus* (Syn. *Echinorhynchus gigas*) from Cameron. The thirny-headed worm, natural size, transverse wrinkled and of pale reddish color. The egg (pictured enlarged) is 60 to 110 microns long**

Effect of Sulfanilamide on Spermatozoa

Primarily because of its bearing on artificial insemination, studies[10] were undertaken to determine the levels of sulfanilamide required to prevent growth of the bacterial types found in semen collected from bulls and the effect of the sulfanilamide on the livability and metabolic activity of spermatozoa. The addition of 300mg of sulfanilamide per 100cc of yolk-citrate diluent gave a significant improvement in the livability of ejaculated bull spermatozoa over a 20-day storage period and prevented bacterial growth. Sulfanilamide depressed glucose and oxygen utilization at all concentrations studied. The accumulation of lactic acid was increased both absolutely and in relation to the glucose utilized in the presence of sulfanilamide.

The data obtained on the effect of sulfanilamide on the fertility of diluted bull semen are regarded as preliminary, but no deleterious influence on conception rate was indicated. "It would appear from these studies that in sulfanilamide or other sulfonamides a key to the control of bacteria in semen and control of possible spread of certain infections by artificial breeding is available. The action of sulfanilamide is selective for it is either bacteriocidal or bacteriostatic, but permits bull spermatozoa to live longer."

Control of the Horn Fly in Kansas

The objects of these cooperative tests[9] (1945) were to determine the duration of effectiveness of DDT sprays and dips against the horn fly under field conditions and its value to the cattleman for controlling this pest, and to familiarize livestock owners with the proper use of the chemical for treating animals against flies and other external parasites. When all animals in a herd were sprayed, the average duration of effectiveness increased with each treatment, but when only half were sprayed the duration was no greater after the third than after the second spraying. Four dippings of 0.1% DDT were effective for as long a time as the four sprayings with 0.2% DDT, but dipping required about three times the amount of chemical. The tests gave important information, not only on the effectiveness of DDT against the horn fly but on the amount of damage done by it to the cattle industry. Estimates based on one of these tests indicated that the loss of beef due to horn fly injury would amount to 85,980,000 pounds, or a value of approximately $8,598,000 annually. Residual sprays applied to barns for control of housefles and stableflies showed that nine barns sprayed with a 5% DDT emulsion were practically free of these pests for 73 to 98 days.

DDT in Control of Horn Flies and Ticks in Florida

Spraying and dipping[6] of 8,402 beef cattle in 36 herds in southern Florida for control of horn flies by DDT indicated the following: The extremes of summer weather — particularly heavy daily downpours—quickly rendered inactive the deposits from low-concentration sprays. Deposits from suspensions resisted inactivation better than those from emulsions. Deposits from sprays of 1% or more DDT suspensions remained lethal to horn flies for almost two weeks and kept horn fly population on whole herds at insignificant levels for over a month; deposits from sprays of 1.5 and 2.5% DDT suspension remained active little if any

[14] Rausch, R. New records of Macracanthorhynchus hirudinaceus in Sciuridae. *J. Parasit.*, 32:1, p. 94. 1946.

[10] The effect of sulfanilamide upon the livability and metabolism of bovine spermatozoa, Knodt, C. B., and Salisbury, G. W. *J. Dairy Sci.*, 29:5 pp. 285-291. 1946.

[9] DDT for the control of the horn fly in Kansas, Laake, E. W. (U. S. D. A.). *J. Econ. Ent.*, 39:1, pp. 65-68. 1946. Abst. *Exp. Sta. Rec.*, 95:4, p. 542.

[6] DDT to control horn flies and Gulf coast ticks on range cattle in Florida, Matthysse, J. G. *J. Econ. Ent.*, 39:1, pp. 62-65. 1946. Abst. *Exp. Sta. Rec.*, 95:4.

longer, and the much higher cost of the 2.5% renders it of doubtful value. For long-lasting residual action from emulsions it appears that at least 2.5% DDT is required in the spray. Dipping proved more effective at equal concentration than spraying but requires so much more material that it is of doubtful practicability; spraying with 1% DDT is far cheaper than dipping in 0.25%. A very rapid and effective method of spraying is to arrange many nozzles inside a chute so as to cover the whole body of the cattle run through the spray. The treatment apparently reduced mosquito populations in some cases, but had little effect on tabanids. Inclusion of DDT in adhesive sprays or greases applied to the ears of cattle markedly reduced the incidence of screwworm ear cases predisposed by Gulf coast tick infestations.

Interferences Between Viruses

In investigations[15] one strain of yellow fever virus was found capable of completely suppressing the growth of some other strains of the same virus even when the strains suppressed were added in large amounts to the culture.

The same strain of yellow fever virus which suppressed other strains of that virus either partially or completely suppressed the growth of the Venezuelan equine encephalomyelitis virus, depending on the amount of the encephalomyelitis virus introduced into the culture.

Intestinal Obstruction in Dogs

In a study[11] of the cause of death in 204 cases of acute mechanical obstruction of the small intestine, peritonitis was found to be the greatest single cause, accounting for 55% of fatal cases. The study included patients treated surgically for this obstruction during 1936 to 1945 at the Johns Hopkins Hospital. Obstruction was demonstrated in all cases at operation. The mortality rate in the series was 20%. Experimental work done by the authors is referred to, in which massive doses of penicillin prolonged the lives of dogs with strangulated obstructions. It was found that dogs so treated could be cured by resection after a period which was twice the survival-time of untreated control dogs. The authors conclude that penicillin may therefore serve as an aid to sound surgical therapy in intestinal obstructions in man. Strangulation was demonstrated in 22 of the 41 deaths in the authors' series.

[10] *J. Exp. Med.*, 83, pp. 195-219. 1946.
[11] Calihan, R. J., Kennedy, J. D., and Blin, A. Efficacy of penicillin therapy in intestinal obstruction. *Bul. Johns Hopkins Hosp.*, 79, pp. 21-33. 1946. Abst. from *What's New.*

Antiserum for Trichinosis

Antigenic substances from the larvae of *T. spiralis* were adsorbed onto aluminum hydroxide cream which was subsequently injected into rabbits.[12] A high degree of resistance to infection developed in the rabbits and they produced a high-titer antiserum which conferred a passive resistance to infection on rats.

Control of Fowl Typhoid with Sulfa Drugs

An epidemic of fowl typhoid appearing in a flock of 400 week-old battery-raised chicks caused 20% mortality within three days. At this time the flock[5] was divided into two groups. Group 1 received the usual care, consisting of removal of sick chicks, cleaning and disinfection of the battery with cresol solution. Group 2 received no such care, but instead was given 0.1% sodium sulfathiazole in drinking

Disinfect the batteries with cresol solution

water for a period of one week. At the end of the week, 80% of the chicks in Group 1 had died. Losses in Group 2 had been reduced to 4%, with no mortality during the last three days of the week.

The chicks in Group 2 were taken off sulfa drug treatment and within five days the infection reappeared. Drinking water containing 0.1% sodium sulfathiazole was again supplied for one week, and the epidemic was checked with a 2% loss. After a second week without treatment another outbreak of the infection occurred, and the chicks were returned to still another week of sulfa drug treatment. At the same time, the battery was thoroughly cleaned and disinfected, and no further losses occurred after discontinuance of the treatment.

[12] Dorin, R. P. The preparation and demonstration of an antiserum for *Trichinella spiralis*. *J. Parasit.*, 32, pp. 83-86. 1946. Abst. in *Vet. Bul.*, 16:11. 1946.
[5] Some observatons on the control of fowl typhoid infection with sulfa drugs, Holtman, D. F., and Fisher, G. *J. Bact.*, 51:3, p. 401. 1946 Abst. *Exp. Sta. Rec.*, 95:4, p. 568.

Book Reviews

Aids to Goat Keeping.—By *Corl Leach*, editor of *Dairy Goat Journal*. Fifth edition; 143 pages; illustrated. Published 1946 by *Dairy Goat Journal*, Columbia, Mo. Price $2.00.

This little book is for the beginner and the more experienced in raising dairy goats. It discusses choosing a breed, housing, equipment,

Scabies and other parasites are discussed

management, feeding, breeding, care of the parturient doe, of the dry doe, of the kids and of the buck. Also milking, care of the milk, udder troubles, other ailments and parasites from the goatkeeper's viewpoint.

The theme of the work is epitomized in the following quoted sentence: "There is no greater 'aid to goatkeeping' than the common sense of the goatkeeper."

* * * *

The Problem of Fertility.—Edited by *Earl T. Engle*. 253 pages, illustrated. Published by the Princeton University Press, Princeton, N. J. 1947. Price $3.75.

This book comprises the papers presented at the Conference on Fertility of the National Committee on Maternal Health, and the discussions following the presentation of each.

The following description of this work by the publisher cannot be improved upon.

"Biologists, medical researchers and veterinarians have been studying fertility intensively especially in the last 10 years; and the results of their investigations have immense value for the present and show promise for the future. This collection of papers and discussions presents the most recent advances in the field.

"Many of these advances have not been known to clinical investigators. This book represents a meeting of minds and an exchange of ideas on problems of fertility which are both of great economic importance to animal breeders and of clinical importance to physicians.

"The work of 19 leaders of research is given in detail, and others are represented in the discussions."

Discussions of special interest to veterinarians include: Ovulation and estrus of sheep and goats; Induction of ovulation and subsequent fertility in domestic animals; Induction of ovulation in domestic animals; Spermatozoa and the cervical mucus; Glyolysis, livability, and fertility of bovine spermatozoa; Biology of equine spermatozoa; Artificial insemination of dairy cattle; Effect of synthetic thyroprotein on sterility in bulls and methods of determining the time of ovulation in domestic animals.

* * * *

Allergy.—By *Erich Urbach*, M.D., Chief of Allergy Service, Jewish Hospital, Philadelphia; Associate in Dermatology, University of Pennsylvania School of Medicine; Member, Board of Regents, American School of Allergists, with the collaboration of *Phillip M. Gottleib*, M.D., Associate on Allergy Service, Jewish Hospital, Philadelphia; Instructor in Medicine, University of Pennsylvania, School of Medicine; Fellow American College of Allergists. Second edition; 968 pages, 412 illustrations. Grune & Stratton, New York, 1946. Price $12.00.

One must be astonished, first that the subject of allergy should require such a monumental work and second that a work so comprehensive should require to be completely revised and rewritten within three years of initial publication. The explanation lies in the huge strides the study of allergy has made and one may add the rapid accumulation of victims of allergy.

The existence of allergy is not a recent discovery. In the second century the Babylonian Talmud gave precise instructions on how to combat intestinal egg-hypersensitiveness. Galen knew of allergy to goat's milk and physicians of the middle ages were aware of asthma due to pollens. In 1819 the first account of hay fever appeared and 20 years later Magendie published the first record of experimental anaphylaxis. It was induced in a dog by injection of a foreign serum. Such terms as hypersensitivity and idiosyncrasy have been in frequent use for a long period and in part referred to allergies.

However, the importance of allergy appears to be modern. To quote from the first edition: "The medical historian of the future will undoubtedly have to report that the first half of the 20th century was distinguished by an alarming increase in the incidence of allergic diseases in the so-called civilized countries," and again "if it were really true that the hereditary factor is of such great importance [in the incidence of hay fever and asthma] how should we explain the fact that within one generation (1900-1930) the number of cases of these diseases, in America alone, rose from a few tens of thousands to a figure of several millions?"

In the present edition the discussion of the

increasing prevalence of allergosis is continued thuswise: "It is becoming increasingly apparent that the incidence of allergic diseases has attained an all-time peak. There are many instances in which an entire family, parents and children alike, suffer from some form of bronchial, nasal, gastrointestinal, cutaneous or cerebral hypersensitiveness, and very few in which at least one member is not afflicted."

This phenomenon has resulted in an immense literature. The author found it necessary to add nearly 1300 new references to this edition, bringing the total to 3325, of which fewer than a dozen are to veterinary literature. This poses a question as to whether animals suffer from allergies to any considerable extent. It's a question no one can answer for no one has investigated the matter. There are animal diseases of unknown cause in most sections of the country, most of them mild, and looked upon as unimportant. Further, many of the recognized allergies of man would be subclinical ailments in animals and seldom recognized.

Only a small part of the work applies especially to veterinary medicine—mainly anaphylaxis in laboratory and other animals; hay fever in the dog of which a good description and excellent illustrations are given, allergy due to contact with the products of Brucella organisms, allergy due to animal products, dandruff, hair, feathers, etc., allergy due to bacterial vaccines, diagnostic allergic reactions and serum sickness.

* * * *

Animal Pathology.—By *Russell A. Runnells*, D.V.M., M.S., Professor of Comparative Anatomy, Michigan State College; formerly Associate Professor of Veterinary Pathology, Iowa State College. Fourth edition; 639 pages; 229 illustrations. Published by the Iowa State College Press, Ames, Ia. 1946. Price $7.00.

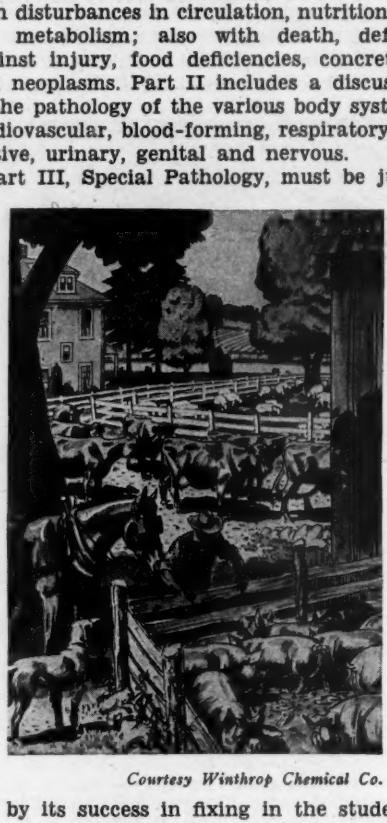
Runnell's Pathology is proving—has proved—its usefulness. Four editions in twice as many years is conclusive evidence of its acceptance. The work has improved with each edition both scientifically and in the manner of presentation.

Any book reviewed in these pages, or any other book if available, may be obtained by remitting the published price to VETERINARY MEDICINE, 7632 S. Crandon Ave., Chicago 49.

The plan of the work is unchanged in the present edition. The text is divided into three parts, General Pathology, Systemic Pathology and Special Pathology of the Specific Diseases. The attempt has been made to correlate the fundamentals of pathology with the clinical manifestations of disease in order to hold the interest of the student and lead him by gradations from the preclinical to the clinical part of the veterinary curriculum.

Part I deals with the causes of disease and with disturbances in circulation, nutrition and cell metabolism; also with death, defense against injury, food deficiencies, concretions and neoplasms. Part II includes a discussion of the pathology of the various body systems, cardiovascular, blood-forming, respiratory, digestive, urinary, genital and nervous.

Part III, Special Pathology, must be justified by its success in fixing in the student's memory the preceding text and preparing him for clinical studies. In this section 57 diseases are discussed in 114 pages; an abbreviation that can include but little information concerning any of them.



Courtesy Winthrop Chemical Co.

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Useful Bulletins, Circulars, Etc.

Fowl Typhoid.—Circular No. 755, USDA, Washington 25, D. C.

Infectious Bovine Mastitis.—16 pages by D. A. Sanders. Bul. 424, Florida Agr. Exp. Sta., Gainesville.

Internal Parasites of Cattle.—USDA Cir. No. 614 (1942). Superintendent of Documents, Washington 25, D. C. Price 10 cents.

Diseases and Parasites of Sheep.—USDA Farmers' Bul. No. 1330 (revised 1946). Superintendent of Documents, Washington 25, D. C. Price 10 cents.

The Dog Tick.—The Biology and Control of the American Dog Tick. USDA Technical Bul. No. 905 (1946). Superintendent of Documents, Washington 25, D. C. Price 15 cents.

Veterinary Practice VIII

Surgery

By E. T. BAKER
Moscow, Idaho

TO be an expert surgeon requires a certain "knack" and manual dexterity that many of us do not possess. The writer is fully aware he is only an average "cut-up," and, in addition, he does not care particularly for "lancin" animal tissues.

In the "good old days," when the practitioner was known far and wide as a "veterinary surgeon," he was expected to scatter blood over the adjacent landscape.

After "Doc cut out a thistle," all the neighbors marvelled at his skill. In some cases he merely left a couple cervical vertebrae intact for the animal to rest its head on. The site of the operation, usually performed just behind the manure pile, was crimson with gore and pieces of equine muscle.

Being located only ten miles from a free state college clinic has allowed me to sidestep many messy operations that cause the private practitioner without hospital facilities more grief than the fee justifies. It is often better to lose a ten-dollar surgical operation than to perform it and spend forty dollars' worth of time on the after care.

This attitude of not rushing into surgery until it cannot be avoided, has its good side. Not long ago we were asked by the owner of a fine young Palamino stallion to come out and castrate the colt. We drove out, but when we tried to palpate the testicles we could locate only one. The animal was very thin and "built close together," so that a high flanker job would be almost as difficult as a ridgling.

We advised him to allow the colt to go until both testicles descended, but the owner wanted it "done right now." We suggested he have some other veterinarian do the work, which he did, and in three days the patient was under ground. The owner told me afterwards "the colt was down nearly an hour while th' guy was fishin'." Now, this fatality was not due to lack of skill on the part of the operator; he just attempted the impossible. He should have had a child's hand for that operation.

I can well remember my first cryptorchid operation. It was in a large, vicious, grade colt, with one very large testicle visible. However, I had a good helper, and we had the animal securely tied out in a clean orchard.

After making the incision, I worked my coned fingers up the canal, and soon felt something dropping into my hand. I pulled it out, and it proved to be the hidden testicle. It was really nothing but a high flanker, but I received great credit. That was all I ever did receive, for the owner moved away the next week.

The second case was decidedly different. Proceeding as before, I was surprised to find nothing but warm equine tissues just as God created them, and "Sep" Sisson described them. I worked up to my elbow, and fished and sweated and was extremely red in the face. Then, suddenly something dropped in my hand, and I grasped it and pulled it out. It proved to be a rudimentary testicle all right, but it slipped out of my clutch, and disappeared. Now, it was do or die, because the owner knew the bashful testicle was in the immediate neighborhood, and right then and there I did some concentrated thinking. I told my helper to have the vulsellem forceps ready and "sock" them in the testicle when I pulled it out again, which he did. I have used that little wrinkle for every high flanker or for soft, mushy yearlings ever since.

In dealing with animals, the first thing to consider is proper restraint, and the second is to make the fee large enough to compensate one for the work and time involved in doing the very best job of which one is capable. Let someone else do the "so-so" job where the owner won't pay for a good job. Or if circumstances are such one must perform an operation for an inadequate fee, do a good job anyhow and remember "time at last sets all things even."

Some farmers seem to think if a veterinarian castrates a colt in May and it makes a fine recovery, but is foundered in August, the latter ailment should be "doctored" very cheaply. But, if a neighbor operates on a colt and septicemia sets in, the owner will cheerfully pay $10 or $15 to the practitioner, to whom he refused earlier to pay $5.00 for the operation.

All these peculiar things about "farm yard surgery" will be learned sooner or later.

Surgical Equipment

Our castration outfit, and methods of operation have been described in preceding pages. It is unnecessary to repeat them.

An old veterinarian told us years ago: "Never own a pair of dehorners. They'll cause you more grief than they're worth."

Later observations taught me the old gentleman was 100% correct.

Farmers and handy men do the work in our

territory for about four-bits a head, while we make considerable more than that with far less work taking care of the "abnormal complications," to put it politely.

A Few Suggestions

I always diluted tincture of iodine with an equal quantity sulphuric ether, when I used this agent on horses, which is rarely. Now that mild tincture has come into use I find no need for the old caustic, tissue damaging, 7% tincture.

Adhesive barbed wire balsams of the scarlet red type are good.

If it were not for the expense, two of the most "healing agents" for cuts would be balsam of Peru and compound tincture of benzoin. The newer sulfa preparations are also very satisfactory.

As a rule, we do very little suturing, except in large flap wounds; we never pack ridglings; we never use poisonous agents around cattle; do not try to hurry nature.

Bandaging the average wire cut in summer often creates a "mushy" sore, and may promote exuberant granulations.

For excessive hemorrhage, 20cc hemostatic serum in 250cc calcium gluconate is fine. We give it intravenously to horses, and in the scapular muscles in cattle.

A good blood tonic, of a brilliant red color, to be given in the feed, is a great comfort to the owner in treating a bad wound.

To freshen and stimulate an indolent wound, salicylic acid and balsam of Peru in yellow petrolatum has always given us good results.

The regular gall lotions are excellent applications for deep cuts.

One will never become a millionaire performing teat operations.

And, finally, put yourself in the owner's place. Suppose you own the animal, and you call in a veterinarian. You want him to tell you what he thinks of the value of the operation; how it may turn out; approximately the expense, barring unforeseen complications, and to advise against doing it, if that is the better procedure. Adhering to this simple rule may save many embarrassing moments, and give you more time to listen to interesting radio programs, if any.

Reverting again to the subject discussed at the beginning of this article: I would not want anyone to think I deprecate good surgery in its place. It is a reputation builder and a practice builder. More than most of our other work it sets apart the skilled from the quack. It is often the only means and still more often the mildest, quickest and best means of relieving the afflicted animal. Just don't over do it. Dr. Rembrandt Morgan, in the January, 1936, issue of VETERINARY MEDICINE gave this warning against unnecessary surgery more forcefully than I have ever seen it phrased elsewhere. His advice is well worth repeating. It reads:

The Sorrel Mare or Why I Am Not a Great Surgeon

Once upon a November day long ago, when the writer was a senior student in a veterinary college, a beautiful sorrel mare that showed unmistakable signs of having been dipped in Belgian blood, was presented at our clinic. Then as now, good horse flesh was my weakness. I at once recognized her as a good one.

Imagine our surprise a few days later when word was passed around that a famous surgeon (now deceased) from afar off was coming to perform the radical operation for fistula of the withers. A scarcely noticeable enlargement was visible on the withers.

The surgical wizard arrived in due time and the stage was set; the mare was placed on the operating table and given a general anesthetic. The operation was started by cutting along the median line in the region of the withers for a distance of at least 12 inches and continued by cutting through perfectly good muscle tissue to a depth of five or six inches. A section of the ligamentum nuchae about two and one-half inches long was removed. It was said to be necrotic. During the course of the operation, the boys on the clinic floor caught two, ten-quart buckets full of perfectly good red blood as it ran off the edge of the operating table. The wound was packed with several yards of gauze and sutured.

The next day when the sutures were removed, the cavity could have contained the crown of an old style derby hat and was standing brimful of serum. The shrewd old dean said: "Boys, this is a good example of what you will not want to do in practice." I made up my mind there and then, that at least one, should he squeeze through the final examinations, was going to take that advice.

The mare was kept in a clinic all winter and the wound was dressed daily.

The last time I saw the Sorrel Mare, which was a few days before graduation in April, she was but a shade of her former self. The wound on the withers was almost healed, but there was an enlargement at the last dorsal vertebra as large as my fist and it looked suspiciously like it might contain pyogenic organisms. Her once beautiful skin now covered only a skeleton and she walked with a faltering step. Her sunken eyes had an expression that told their own story. A wound can be mortal without destroying life, for she was not the same animal that had pranced into our clinic five months earlier.

I know not the ultimate fate of the Sorrel Mare, but I am convinced that the opportunity to observe this case prevented me from becoming a great surgeon. I would not deter anyone from any surgical aspirations, but whenever I hear either a veterinarian or an empiric extoling the radical operation for fistula of the withers, my mind automatically reverts, back across the years, to the "Sorrel Mare."

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(To be continued)